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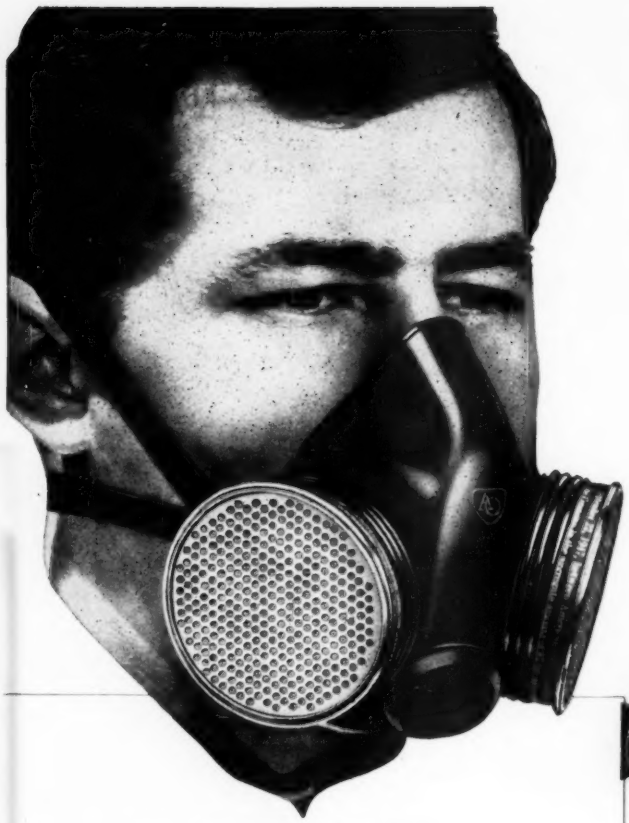

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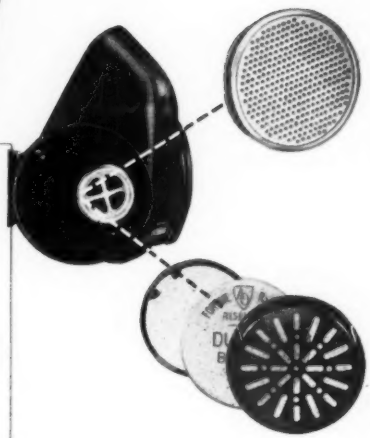

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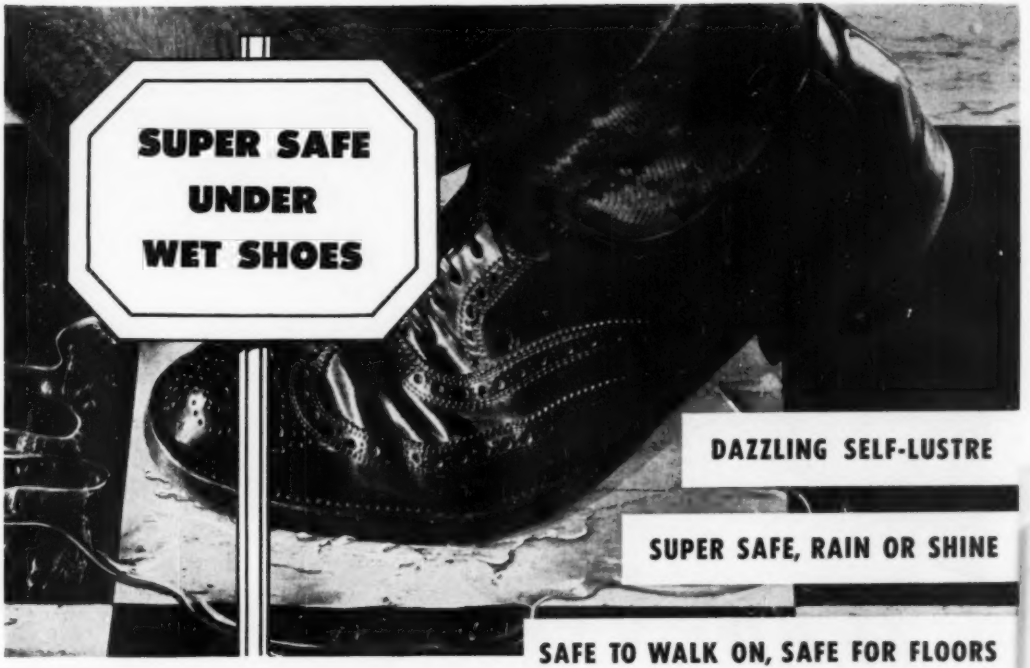

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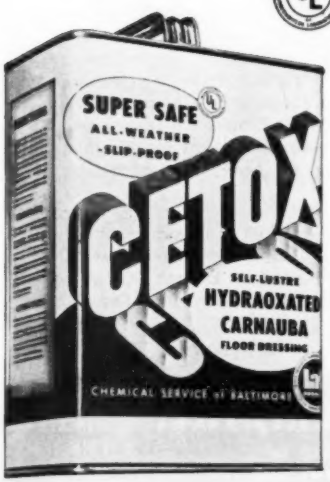

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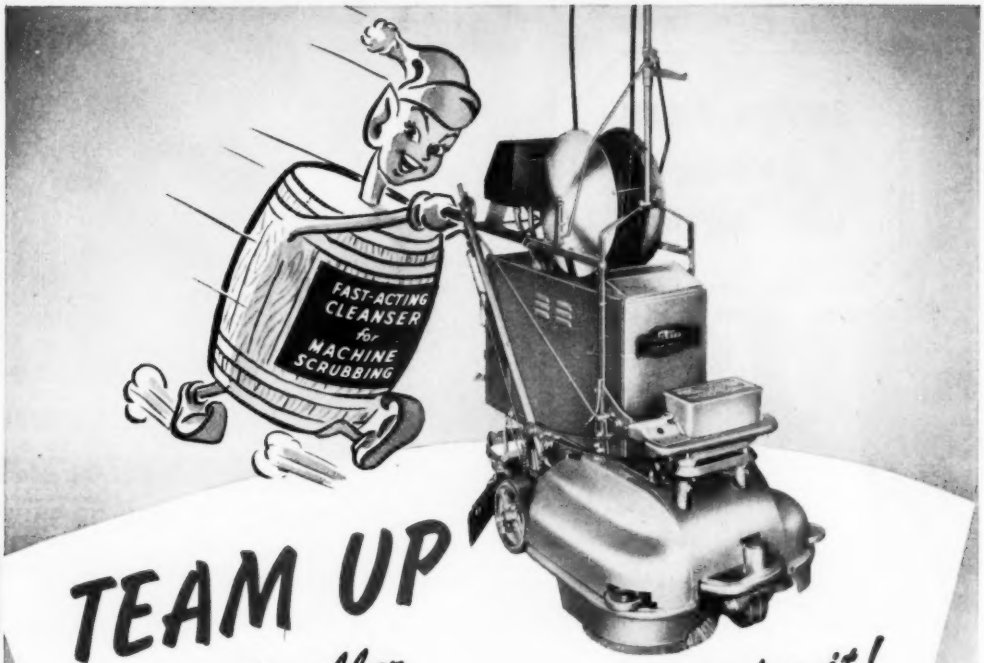

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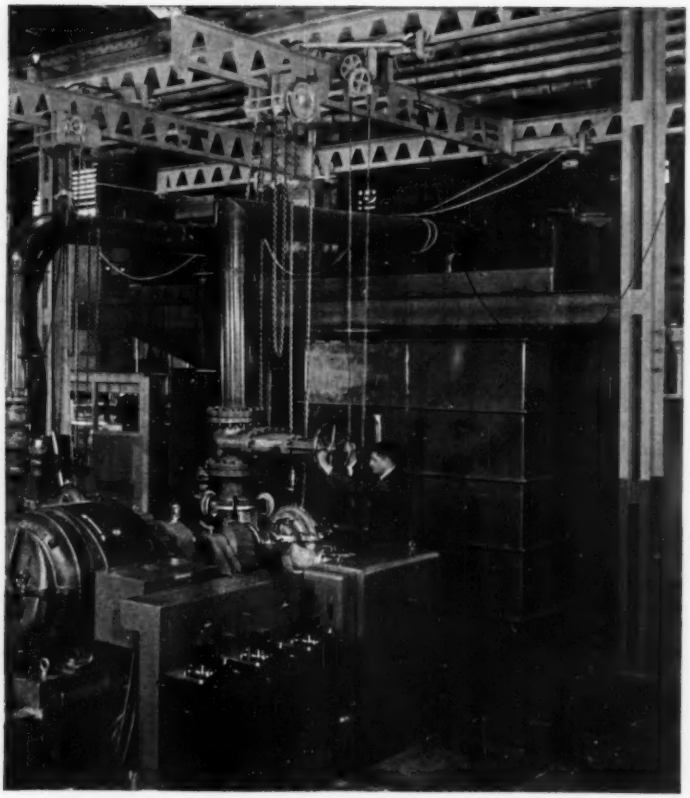

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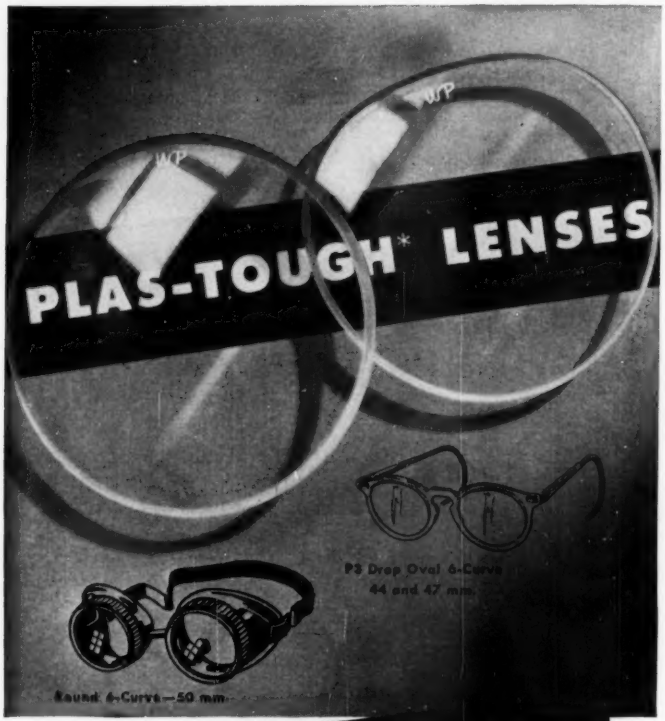

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EST. 1901

VOL. 102, NO. 3 SEPTEMBER, 1951

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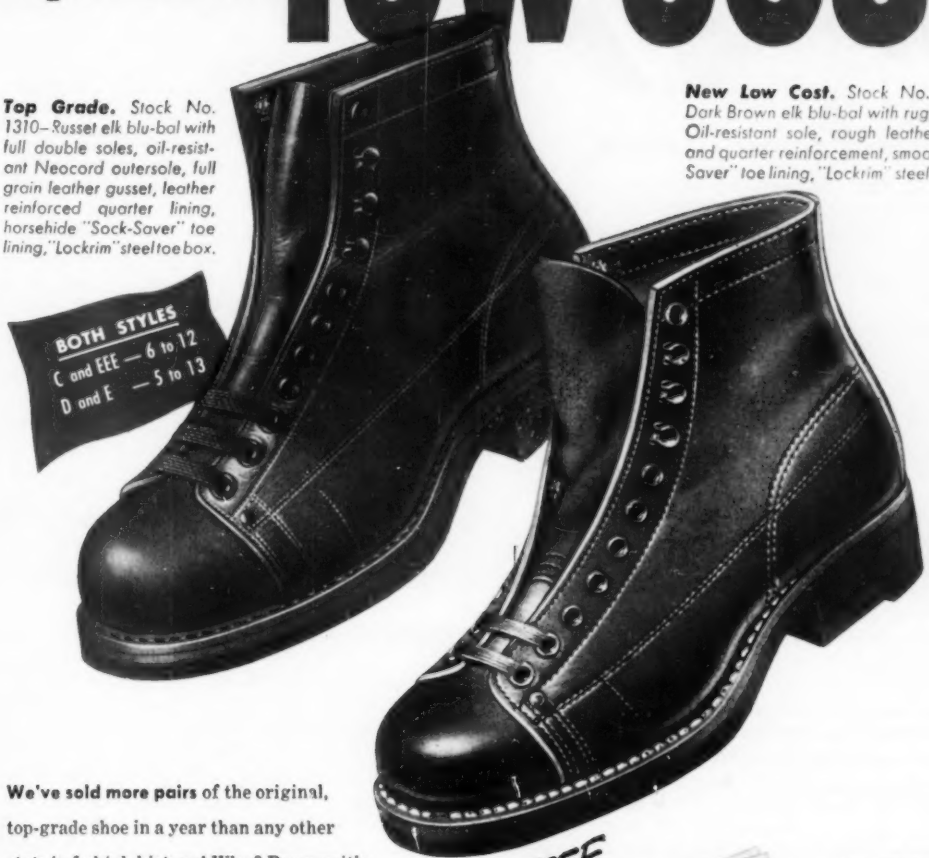

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It's Safe to Say

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★ VIGILANCE AGAINST AGGRESSION

WITH fingers crossed, the American people have awaited each new announcement from the United Nations envoys at the long-drawn-out Kaesong negotiations. Time and again, hopes have risen only to be dashed once more by the stubborn demands of the opposition or by suspicions of its sincerity. Much as this country fervently has desired a workable solution to the Korean problem through peaceful means, the whole Korean affair along with other international tensions, has finally crystallized a change in attitude of the American public that has been gradually forming during the past few years. The temper of American thought has shifted away from wishful complacency and toward a more realistic appraisal of our role in maintaining international equilibrium.

Regardless, then, of the outcome of the present Korean situation, we must make up our collective minds that the United States must henceforth be considered in an entirely new light because of the necessity of our permanently keeping our military strength at a high level. No longer can we be viewed as a nation that delays mobilization of men, materials and all the other factors of preparedness until after we are the victims of a sneak attack.

Other countries, both those whose concepts are contrary to our own and those whose ideals are similar to ours, should take note of this shift in attitude. It may well be a decisive one. We have now recognized that eternal vigilance is no longer merely a symbol. If we are to safeguard our national way of life, we must be on the alert, ready to protect it and able to protect it.

In making vigilance an actuality, we can expect that for years to come we will have large military establishments. The army, navy, air force and marines will require food, clothing, shelter, transportation and weapons. To supply all these products, manufacturing concerns, already running at near-capacity, will be taxed with still heavier production requirements. Facilities will have to be expanded, new and inexperienced workers will have to be brought into the labor force, employees will be working longer hours, and machines will be in dawn-to-dawn operation. With every production hour so vital to the nation's welfare, safety progress must keep pace with the increased tempo. The armies of new industrial workers must be protected, they must be trained in the safe way to do their jobs, safety programs must keep them alert to environmental hazards, protective equipment must be available to them, and machines must be maintained at top efficiency.

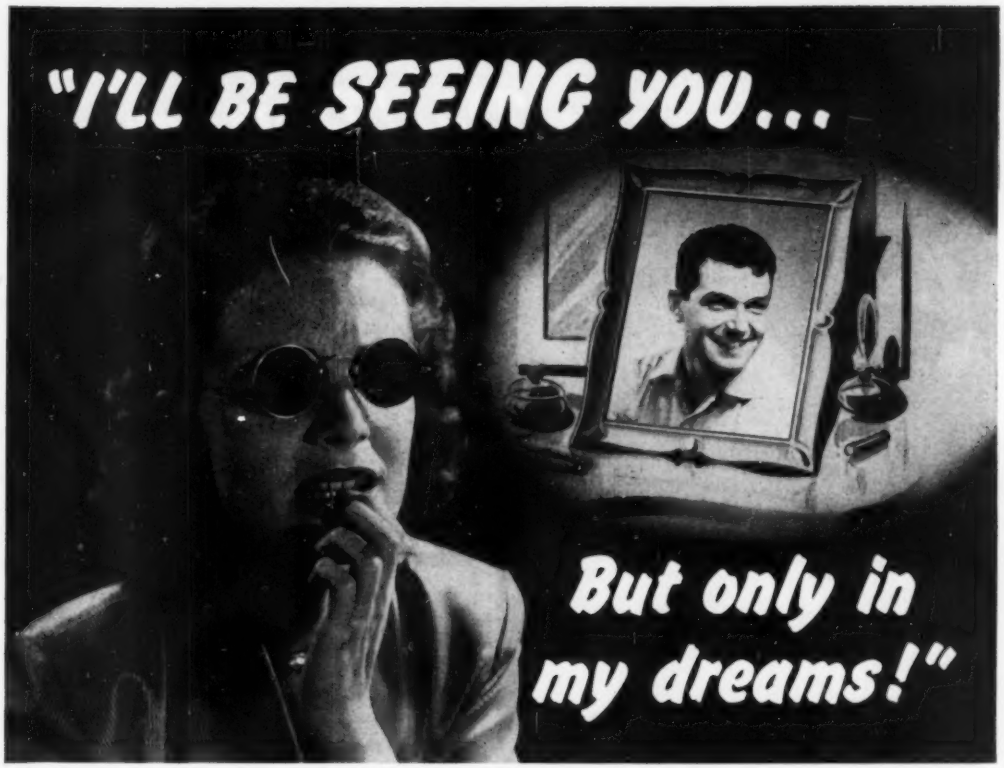
There is no place in industry's tight production schedule for costly delays caused by accidents or poor maintenance. Such delays mean wasted manpower and fewer goods, not to mention the direct and indirect expenses of the accidents themselves. If the United States is to be vigilant on the international scene, then American industry must be vigilant to preserve an orderly production front free from accidents so that it can supply the tools for the armed forces. This may be a new challenge to some phases of industry, but it certainly is not new to the safety movement. In fact, safety leaders can take a pardonable pride that "Vigilance," which has for so long been a basic concept in accident prevention, is now being accepted as a watchword in aggression prevention—R. P. E.

★ SAFETY'S BIGGEST SHOW

THE growth of the safety movement is demonstrated by the emphasis on the National Safety Congress which attracts delegates from not only all parts of the United States but Canada and the Latin American Republics as well. The week's convention long ago outgrew the facilities of any single hotel in Chicago with the result that subject sessions are held simultaneously at various hotels throughout Chicago's Loop. Exhibits too have burst the seams of any one downtown convention hall with the result that the large overflow will be taken care of in the spacious Congress Hotel, two blocks from general headquarters.

With new industrial processes bringing new hazards, it is increasingly important for industrial concerns to have representatives attend the safety congress which this year opens October 8th in Chicago. Equipment, devices and products designed to cope with new hazards will be on display, meetings covering accident prevention, maintenance and other factors of industrial operation should attract a record throng, particularly in these days when science has opened up vast new fields.

The October Chicago Convention is safety's biggest show which each year seems to outdo all former meetings. Delegates to this year's convention can be confident that once more it will be bigger than ever.



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A complete range of Bausch & Lomb safety eyewear, engineered to meet the most rigid tests for each job classification in your plant.

3 PROTECTION *PLUS* CORRECTION
For at least 50% of your workers prescription lenses are necessary to working efficiency as well as to safety. Your B&L distributor offers prompt prescription service on all types of industrial eyewear.

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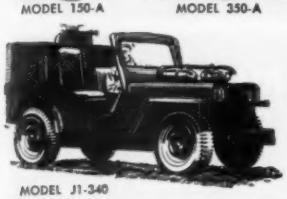
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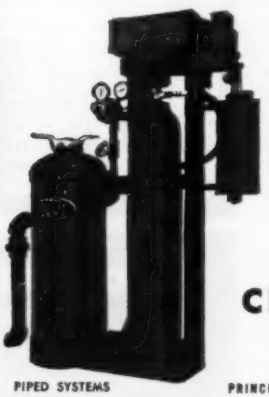
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SAFETY MAINTENANCE & PRODUCTION

VOL. 102, NO. 3 • SEPTEMBER, 1951

Picture by courtesy of Eastman Kodak Co.

The safety director must be able to SELL his ideas to employers and employees.

SAFETY ENGINEERING In a Nutshell

By ROBERT M. McGOWAN

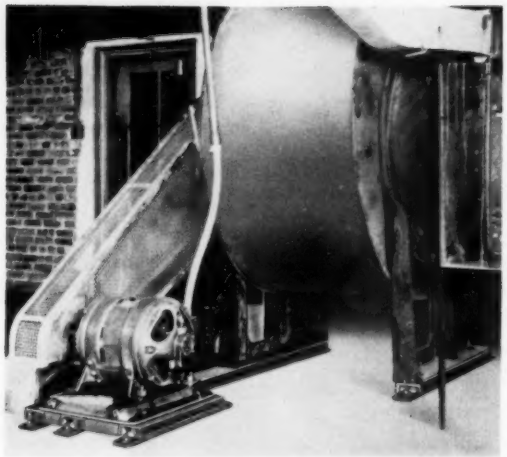
INDUSTRIAL safety engineering in a nutshell amounts to the application of common sense to everyday work methods by both management and labor. A good safety engineer should be a combination of four characteristics, namely: *Ingenuity, Patience, Perseverance* and *Salesmanship.*

1. The safety engineer uses *ingenuity* to devise and create methods to eliminate causes of accidents and to remove hazards. He uses *ingenuity* to originate new approaches to getting verbal, written and poster safety material across to the plant employees and management. A safety engineer must have *ingenuity* and use it constantly.

2. The safety engineer uses his *patience* to wait for the opportune time to make recommendations and in his struggles with hard-to-solve accident causes. He uses *patience* over a period of time in trying to sell safe work practices to a difficult foreman or supervisor. On many occasions a simple guard on a machine may tax his *patience* because he feels it could be better, and he works on it patiently until it is perfected. *Patience* is a necessity for any safety engineer.

3. *Perseverance* is the necessary asset to keep the safety engineer going when he has suffered setback after setback. When it seems that management no longer says "good morning" in the same way, when even the workers greet him as though he's on his way out to the salt mines, when this situation exists—whether real or imaginary—then the safety engineer uses his *perseverance* and rears up on his hind legs, bites his tongue and digs into his problems and obstacles with a reserve ambition and renewed faith.

4. *Salesmanship!* This ability is the safety engineer's most important and effective weapon. You can devise methods for elimination of the causes of accidents with *ingenuity;* you can solve problems with *patience;* you can *persevere* and lick all obstacles, but you must in the final analysis use *salesmanship* to sell the products of *ingenuity, patience* and *perseverance* —all you have in your mind and on paper—to management or labor. Without this ability you cannot really do the job. Now, by *salesmanship* we don't *(To page 55)*



Integral base on this fan and motor eliminates vibration.

By LYNE S. METCALFE

PRODUCTION JITTERS

Vibration of production tools is a definite factor in the fatigue of both machines and workers. Here are suggestions for eliminating vibration in the smaller machines.

IN MEETING the requirements of national defense, much will depend upon machinery and its steady and efficient operation and use. Along with man-power problems, the rate of production per man hour, industry today must likewise consider how to get the utmost out of "machine hours," and this entails at least remedying a ten per cent loss of potential energy and machine performance through machinery vibration.

More and more this operating factor becomes of interest to the safety engineer because of the close relationship between worker fatigue and rate of production, the result of adequate vibration control or lack of it in many industries.

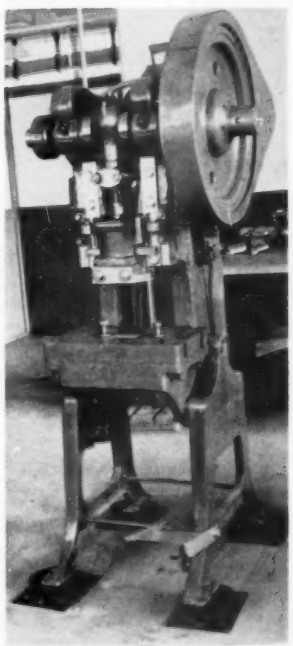
The machinery industry and the industrial machinery user have tended to greatly under-estimate efficiency and production loss and increased operating costs due to such vibration. Only in recent years has the true picture of such loss through vibration transmission and of the possibility of corrective measures been realized among machinery builders and machinery users. Reliable estimates based upon careful tests and studies reveal a somewhat surprising tally of "costs" due to vibration, inherent to a more or less extent in nearly every type of machinery used in industry today and much of this is due to the effect on the worker. Such correctives now:

a) Bring greater all-around operating efficiency.

b) Add to the employees' *safety* margin and tend to improve the workers' health.

c) Reduce spoilage in production processes.

d) Greatly increase *(To page 48)*



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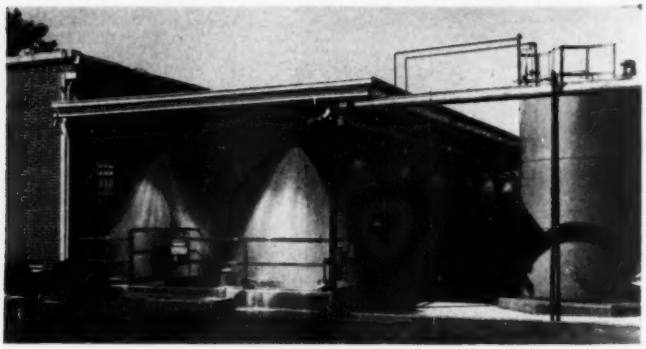
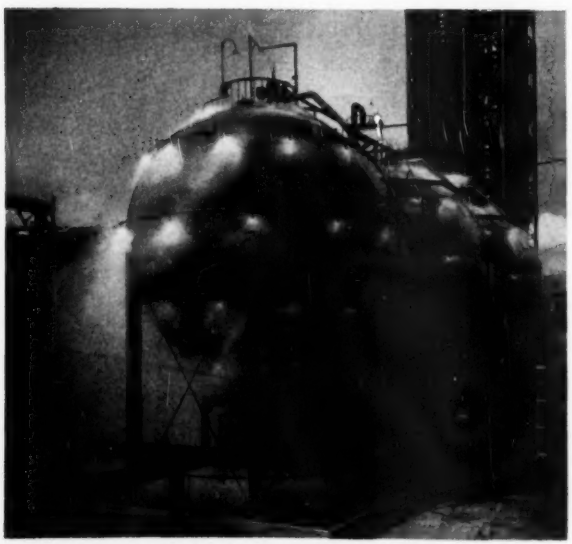


Large pumping station manifold pit protected by an automatic fog-foam system.

FIGHTING FIRE WITH

Water continues to be an essential factor in modern fire protection through recent improvements of portable water fog devices and fixed systems, and the use of wetting agents.

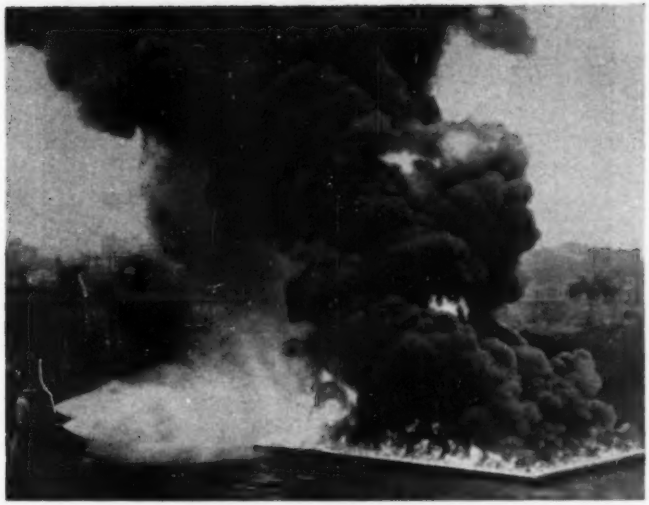


Three hortonspheres containing liquefied petroleum in the heart of a refinery are protected with a water fog system. This system will protect spheres and steel structures from exposure fire and also from destruction from fire in tank area while allowing liquefied petroleum to burn off under control.

WATER has been man's chief weapon against fire from the earliest days of recorded history, and with a little assistance from the modern scientific mind it should continue to be man's primary extinguishing agent for as long as time and man endure. The twentieth century has been one of spectacular scientific advancement in all fields of industry, and the Fire Protection Industry has been no exception to this trend. One of the most important advancements in this field has been the development of water fog or spray.

Water fog is very effective against class "A" and class "B" fires. Class "B" fires in most flammable liquids which have flash points over 100° F. can readily be extinguished by water fog, and fires in lower flash point liquids can readily be brought under control. Before the development of fog, the use of water on flammable liquid fires was actually discouraged. This development has not only been a major factor in maintaining the importance of water as a fire-fighting agent, but it has contributed immeasurably to the safety of man and industry.

FOG



This large flammable liquid fire was quickly knocked down and extinguished with two 1½" water fog nozzles attached to regular fire hose lines. Note how the high velocity water fog pattern protects firemen from flames and smoke. Pressure at nozzle was 100 psi.

By JAMES F. O'REGAN,
Assistant Manager of Engineering
In Charge of Special Hazards,
Rockwood Sprinkler Company
Worcester, Massachusetts

The secret of the successful employment of water fog as a fire fighting agent lies in the characteristics of water itself. One gallon of water will absorb approximately 1,350 B.T.U.'s if raised from 50° to 212° F. This same gallon of water will absorb approximately 8,080 more B.T.U.'s if it is converted into steam. It is quite obvious that water broken into finely divided particles, such as a water fog or spray, will have considerably more surface area than an equal quantity of water in the form of a straight stream. Consequently, of the total water applied to a fire, the proportion of water converted to steam will be a great deal more when water is applied in the form of fog than as a straight stream. This proportion of water converted to steam is an important factor in fire control inasmuch as a gallon of water converted to steam will absorb about seven times the quantity of heat of a gallon of water remaining in a liquid state. It should also be noted that the production of a large quantity of steam in the proximity of the burning fuel reduces the concentration of available oxygen which, in turn, tends to retard the progress of combustion.

It is the intention of the writer to outline briefly some of the applications of water fog in modern industry and to describe briefly the latest devices and equipment which have been designed to obtain maximum effectiveness. Portable water fog or spray devices, fixed systems, and the use of wetting agents as an aid to water fog will be the main topics of this article.

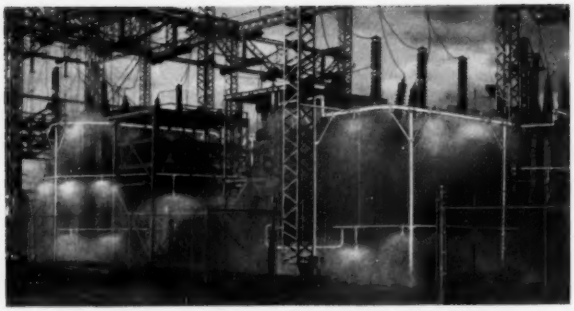
Portable Water Fog or Spray Equipment

In the not-too-distant past, the available portable fog or spray equipment consisted of a limited number of spray nozzles, all of which were in need of further development and modification. However, today the picture has been completely changed, and one finds commercially available many different types of portable fog devices, all of which have merited approval by an excellent fire record.

Versatile nozzles which can be adjusted by simply positioning a control handle to discharge either a straight stream or a high velocity fog are widely used by fire departments and for industrial hose station service. Such nozzles can be used on either class "A" or class "B" fires with much more effectiveness than a straight stream play-pipe. This type nozzle, as supplied by some manufacturers, can also be adjusted by means of a bayonet type adaptor to hold an extension applicator and low velocity fog head. The low velocity fog applicator provides an excellent weapon for fighting flammable liquid fires in open top containers. The United States Navy equips its ships with nozzles of this type, and during the last war these nozzles did much to save such ships as the Wakefield, the Bunker Hill and

FEATURE

This is the first of five feature articles concerned with Fire Protection. The next four articles of the series will be published in the October through January issues of SAFETY MAINTENANCE & PRODUCTION.



A typical installation of water fog guarding two 35,000 KVA transformers against destruction by fire in a large public utility station operation.

many others which were subjected to severe fires at sea.

High velocity, non-adjustable fog nozzles are widely used and highly recommended for fighting fires in transformers and other types of oil-filled electrical equipment. Water fog can be used quite safely on high voltage equipment where a straight stream might be a dangerous conductor. Consequently, for such applications it is imperative that nozzles be limited to the fog-producing type and not be adjustable to a straight stream.

A water fog nozzle for service on ¾", 1", 1½" and 2½" fire hose lines discharges high velocity water fog, straight stream or low velocity water fog from extension applicator as situation demands.

Light-weight fog-foam nozzle with fog-foam screen, available for service on 1½", 2½" or 3½" fire hose lines, discharges fog-foam, long range solid foam stream, or, by shutting off foam liquid supply, an excellent high velocity water fog pattern.

High-capacity water fog nozzles designed to discharge 500 G.P.M. or more from turret deluge guns are valuable tools for fire departments in fighting large scale class "A" or "B" fires.

Cellar and attic pipes which are designed to discharge a wide sweeping pattern of fog can be dropped into a roof or floor hole before firemen attempt to enter a burning cellar or attic. These devices rapidly reduce the space temperature and help to dissipate smoke and gases. There are many other applications for these nozzles such as the under-protection of piers, wharves, etc.

High pressure fog nozzles which operate at pressures as high as 600 p.s.i. are used with fire trucks equipped with high pressure pumps and suction tanks. Whether or not high pressure fog has any advantage over conventional nozzles operating at pressure of about 50 to 150 p.s.i., is a debatable and rather controversial subject, which the writer will not attempt to answer here. It suffices to say that both high and low pressure fog nozzles have been used very successfully for fire fighting service in areas where fire trucks must carry their own water supply, and fires must be extinguished with a minimum of water.

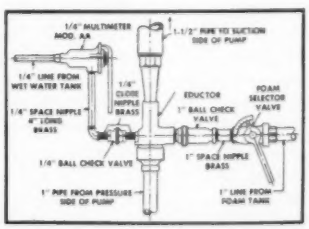
Portable water fog devices are excellent tools in the hands of fire fighters. However, their value can be greatly enhanced if the men who are to use these devices have been thoroughly trained in their use. Where possible, the fire fighters should be allowed to extinguish training fires simulating actual hazards. Such training not only increases the skill of the men, but it instills in them a necessary confidence in their equipment.

Fixed Water Fog or Spray Systems

Fixed water fog or spray systems are used to protect many and varied hazards in the industrial plants of today's world. Transformers, quench tanks, asphalt saturators, extraction plants, catalytic cracking units, and L. P. G. storage tanks are but a few of the many hazards which fixed fog systems protect. Although these systems are a relatively new adjunct to the field of fire protection, the effective operation of many of these systems has proven their value beyond all doubt.

Most fixed fog systems are of the deluge type and are usually automatically operated. Heat-actuated devices are usually used to detect fire. These devices transmit a signal pneumatically to a deluge valve which controls the flow of water to the fog heads located strategically about the hazard.

Fixed systems are designed to either extinguish a fire, to control


1/4" MULTIMETER MOD. AA
1-1/2" PIPE TO SUCTION SIDE OF PUMP
1/4" LINE FROM WET WATER TANK
1/4" SPACE NIPPLE 4" LONG BRASS
1/8" CLOSE NIPPLE BRASS
EDUCTOR
1" BALL CHECK VALVE
FOAM SELECTOR VALVE
1/4" BALL CHECK VALVE
1" SPACE NIPPLE BRASS
1" PIPE FROM PRESSURE SIDE OF PUMP
1" LINE FROM FOAM TANK

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a fire or to protect a unit from an exposure fire. It is quite obvious that lesser concentrations of water fog are required to control a fire or to protect a unit from exposure than to extinguish a fire. In some cases, extinguishment may be impossible or undesirable, as in the case of a Butadienne fire resulting from a pipe line break. Under such circumstances, the supply of fuel would be shut off and the fire allowed to burn under the control of the fog system until the fuel becomes exhausted. Under such conditions, all vessels and structural steel would be completely protected by a cooling envelope of the water fog.

Asphalt saturators and industrial processes using oils at temperatures well above the boiling point of water formerly posed a rather serious problem in that, under some circumstances, the application of water would produce a violent boil over. However, this problem has now been solved by the development of an anti-foam agent. This agent is automatically injected in the proper proportions into the water supply feeding the water fog heads, and all danger of boil over is alleviated.

Water fog heads can be used in some cases to form a very effective water curtain to divide hazards into sections and to prevent a fire from spreading from one section to another. These heads can also be used to protect floor and wall openings where conveyors prevent the use of conventional fire doors.

A recent innovation in the field of fixed water fog or spray systems has been the development of a sealed-type fog head. This head is actuated by the melting of a fusible linkage in the same manner as an ordinary sprinkler head. While such a head cannot be used in most of the applications now requiring deluge fog systems, it does offer many interesting possibilities. Indoor transformers, and some similar hazards, can certainly be protected more economically with heads of this type. Another possibility for the use of such a head is the substitution of this device for ordinary sprinkler heads in buildings containing tires, barrels of flammable liquids, and other hazardous materials. Recent tests have shown the sealed fog head to be much more effective on automobile tire fires than the ordinary sprinkler head, and the results indicate that such superior protection might well be used advantageously in the protection of other hazards.

The applications of fixed water fog systems are too many to be properly covered in an article of this type. However, regardless of the application one cannot stress too much the importance of proper design. In general, fixed systems should be carefully designed by an experienced engineer who is thoroughly familiar with the equipment of an approved manufacturer.

Wetting Agents and Water Fog

Wetting agents are used primarily to improve the penetrating power of water. Water which has been treated with a wetting agent will penetrate bales of cloth, hay and other combustible materials much more readily than plain water. This is an important factor in rural fire fighting because it means that less water will be required to extinguish a class "A" fire if a wetting agent is added to the water than if plain water is used. The wet water required to extinguish such a fire will be about ¼ that of plain water. It is quite obvious in fighting a class "A" fire that water fog and a wetting agent should be used if maximum economy of water is an important factor.

The relatively high surface tension of plain water (about 72 dynes per centimeter) is a primary reason for its lack of penetrating power. A wetting agent reduces the surface tension considerably (to about 30 dynes per cm.) and consequently greatly increases its penetrating power.

While wetting agents are primarily intended for use in fighting class "A" fires, some success has been obtained with them in fighting class "B" fires. However, wetting agents should not be considered as a substitute for foam, especially when fighting fires in low flash point liquids.

Most wetting agents are liquids; however there is at least one on the market which is sold as a solid in capsule form. Customarily the wetting agent is used *(To page 52)*

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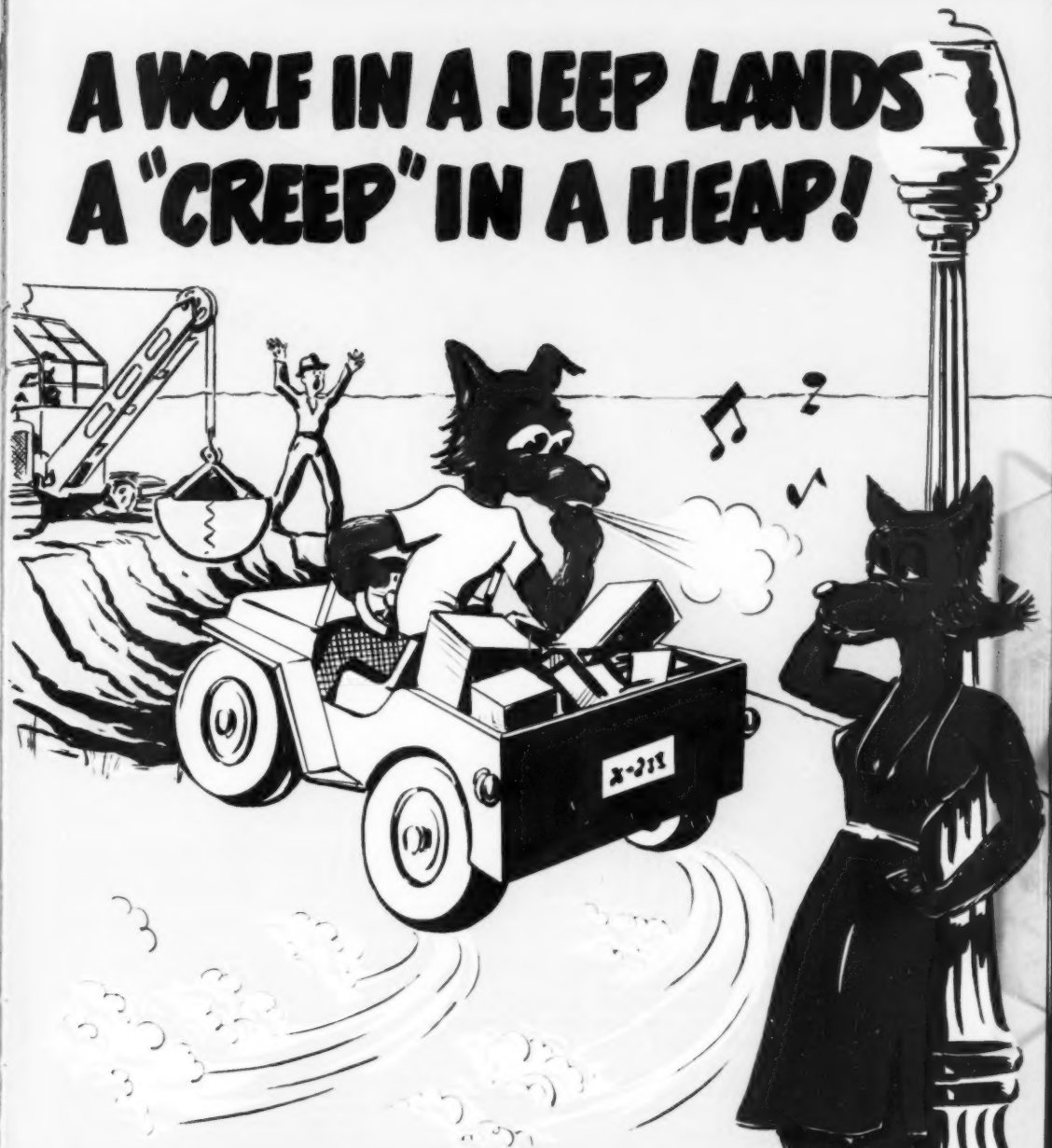

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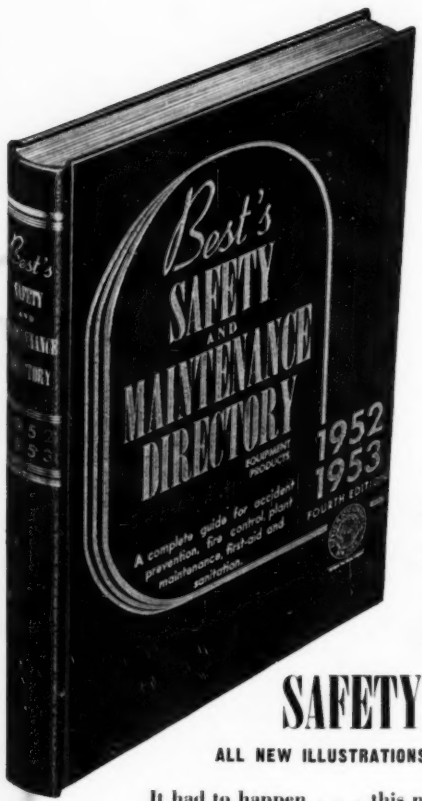

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How to Select a Skin Cleanser

Soap is no longer just soap. It is a complex formulation of many ingredients, and care must be exercised in selecting one that is effective and that will not injure the skin.

By L. W. STAPLES
General Manager
Sugar Beet Products Co.
Saginaw, Michigan

PROBABLY every salesman of industrial hand soap has been told at some time or other—"soap is soap." This is understandable since no one other commodity is so universally used, so easy to obtain and so relatively inexpensive. Being understandable does not, however, necessarily make the statement true. Soap chemistry is a very complex specialty and the formulation of skin cleansers requires a thorough and complete study of both the detergency and the physiological aspects of many ingredients. Thus, the production of an *efficient and safe* skin cleanser becomes a specialist's job within a specialty chemical field. Few indeed are the companies that have personnel available to properly evaluate the many aspects of the products offered to them for use on the skin of their employees.

It is much easier, cheaper and usually more satisfactory to check the "approved manufacturer" than to train a specialist for such a low dollar-volume item.

Industrial skin cleansers fall into one of four types, namely, liquid, bar, paste, and powder. Generally speaking, liquid soaps are satisfactory only for the less tenacious soils because detergency must depend entirely upon chemical action in this type of product. Paste and bar soaps have the same shortcoming unless an inorganic type of scrubber is used. It is, therefore, very understandable why the great swing in industrial skin cleansers is to the powdered types. It is for this reason we would like to highlight a few factors which are given prime consideration by every reputable manufacturer of *powdered* industrial skin cleansers.

First, let's consider what an industrial skin cleanser is supposed to do. (1) The first requirement is both adequate and speedy cleansing of the human skin. And (2) assurance that skin damage will not arise in the process of soil removal. It is essential that all ingredients used in the manufacture of an industrial skin cleanser and intended to meet the requirement of (1) shall ultimately be controlled by requirement (2).

Never before has the manufacturer of industrial skin cleansers had such a wide range of detergents from which to choose for the development of his formula. And conversely he has never been faced with the necessity of a more thorough research program to be assured that the chemicals in his formula will be non-injurious to the human skin. It is well to remember that very little data can be taken from any other field of detergency and converted to the skin cleansing problem. Long and expensive tests have been con-

FEATURE

This is the third of a consecutive series of three major articles on Skin Protection. The first two features, dealing with oil dermatitis and protective creams, appeared respectively in the July and August issues of SAFETY MAINTENANCE & PRODUCTION.

ducted in the textile industry for example on various detergents for their cleaning, shrinkage, and other pertinent factors. These detergents have been combined with water softeners, alkaline salts, and even acid baths, yet none of these are directly applicable to skin cleansing requirements. Textile cleaning operations utilize a high percentage of water and a low percentage of detergent. In skin cleansing this is not the case. One level teaspoonful of powdered skin cleanser, when combined with only two level teaspoonsful of water, will usually produce the creamy type of suds which is most efficient for soil removal from the human skin. It is immediately apparent that water softeners function under an entirely different set of circumstances in textile and clothes washing processes, and results are of little benefit in establishing performance tables for hand washing.

Powdered Cleansers

One of the reasons that powdered industrial skin cleansers are increasing in popularity lies in the fact that it is possible to combine mechanical cleansing with chemical cleansing. The common sense of this can easily be demonstrated by anyone. A grease spot on the face or forearm can be removed only with difficulty by rubbing a cake of pure soap over the soiled area. Yet the spot can be removed almost immediately by placing a very small amount of straight soap on a washrag and rubbing the area. The washrag does not need to be harsh, nor abrasive, but the combination of the mechanical action of the washrag and the chemical action of the soap produces much better results at much lower cost. The most efficient industrial skin cleanser will take full advantage of a "ground up washcloth" in the product.

It is generally conceded by the medical profession, that the organic type of scrubber is preferred over the inorganic materials. There is the further point of settling in sewage systems that must be considered in the choice between light organic materials and the heavy siliceous abrasives. Since the mechanical action should be accomplished without scratching or abrading the skin, then particle shape and size must be given consideration. Sharp splintery sections, obviously, are not to be recommended and a combination of sizes of ingredients that gives both the rolling-massaging action and the flat scraping action frequently produce better results than any one single granulation of scrubber by itself. Corn meal, when properly graded, ground and screened has proven its value over a long period of plant experience.

The chemical action in industrial skin cleansers is accomplished by soap, alkaline salts, phosphates, synthetic detergents and sulphonated oils. The soap portion of the product can properly be selected only after careful research.

High titer soaps (those which melt slowly at washing temperatures) are useful for lubricity, but may be uneconomical, since the time allotted by the average industrial employee for a hand wash does not permit complete solution of this type of product. High titer soaps are not as free-rinsing, and free rinsing is important if skin irritation is to be avoided. The lower titer vegetable oil soaps have definite advantages from the solubility standpoint, but in turn must be carefully selected so as to give maximum detergency with minimum skin irritation. It has been well established that there is a relationship between the length of the carbon chain of the fatty acid used in soap manufacture and the irritating quality of the end product. Many lower titer vegetable oil soaps have different sudsing characteristics and since a progressive type lather is desirable, a blending of oils in the manufacture of the soap or a blending of the finished soaps will usually produce a better product that any one single soap by itself.

Some synthetic detergents, due to their exceptionally high detergent value, will denude the skin of the normal, protective acid mantle which is, itself, an oily substance. The selection of a synthetic detergent, to be used in an industrial skin cleanser therefore, should be made only after extensive patch testing as part of an overall research program. A system for determining the return of the "acid mantle of the skin" has been worked out. It is possible to check skin cleansers and the component chemicals in the skin cleansers to predetermine their effect on the skin. This is the obligation of the manufacturer and the reputable vendor will be able to supply detailed data upon request.

A Special Problem

Phosphates and alkali builders of high pH value are naturally injurious to the normal acid mantle of the human skin. These products which have proven beneficial in formulation for cleaning floors, walls, etc., should be questioned when incorporated in skin cleansers. A recent article from "Industrial Medicine" states in part, "It appears established that alkali builders are detrimental to industrial hygienic soaps in so far as conservation of the skin becomes a consideration."

A skin emollient has been described as a product which leaves the human skin soft and pliable during that period in which the normal acid mantle of the skin is being replaced after detergency. There is a great variance in opinion as to the value of lanolin for such a purpose when combined with the skin cleaning compound. Generally speaking, an industrial skin cleanser which does not abrade through its mechanical action, nor excessively defat through its chemical action, will leave the skin in a sufficiently healthy condition so that the normal protective barrier will be replaced in a relatively short time. Healthy skin is easier to clean and hands easier to clean can use a milder *(To page 55)*

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EXHAUST SYSTEMS CAN GET

Why does an industrial exhaust system require good maintenance?
How can design features reduce the maintenance problem?
How do construction features affect the system's maintenance?
When and how should the exhaust equipment be inspected?

FEATURE

This is the first of a series of articles concerned with Dust & Fume Control. The next article of the series will be published in the October issue of SAFETY MAINTENANCE & PRODUCTION.

By R. T. PRING and W. S. SCHAMEL
American Wheelabrator & Equipment Corp.
Mishawaka, Indiana

TO BETTER understand the need for proper maintenance of the industrial exhaust system, let us first consider why we have these exhaust systems. Generally, the application of the industrial exhaust system falls within the four listed purposes: (a) Safeguarding health (b) Eliminating nuisance, (c) Recovery of valuable dusts, (d) Required in process.

Health safeguard is the primary classification. However, this safeguarding of health is a function of virtually each industrial exhaust system, regardless of which one of the reasons was primary when the decision for purchase and installation of the system was made.

Installations in plating works, foundries, granite industries and the like are representative examples of those systems whose primary mission is that of safeguarding the health by the suppression, dilution and removal of dusts, fumes and gases which would be detrimental to the workers' health.

Installations in woodworking and textile industries where the dusts are not generally considered harmful but constitute a nuisance to the workers is an example of the second application. Elimination of this nuisance has a secondary feature of increasing the efficiency and safety of that operation.

In the third category, we have applications primarily for recovery of product because of its value, such as $5.00 per pound pharmaceuticals, precious metals, etc. Here also health safeguards, increased efficiency and safety are a by-product.

When air is used in the manufacturing or processing operation, such as in the cereal industry and the coal cleaning process, an exhaust system or component thereof is required. With proper application, this system also provides most of the same benefits of health, safety, efficiency, etc.

Now better realizing the need for industrial ventilation, we can agree with such nationally recognized industrial hygienists as Dr. Alice Hamilton who states that since most industrial poisoning is caused by inhalation, it follows that the air of the factory is of chief importance; and, to keep it free from dangerous dusts, fumes and gases is the first measure of protection, all others are secondary.

Drs. Sawyers and Jones, in discussing silicosis and other dust diseases, state: "Although we have mentioned the medical phase of control first, it is of secondary importance in effectiveness compared to that which is accomplished by engineering methods."

Thus we see that a proper exhaust system is our first line of defense against industrial atmospheric contaminants and, further, we must realize that the continued defense against this is possible only so long

Chart #1

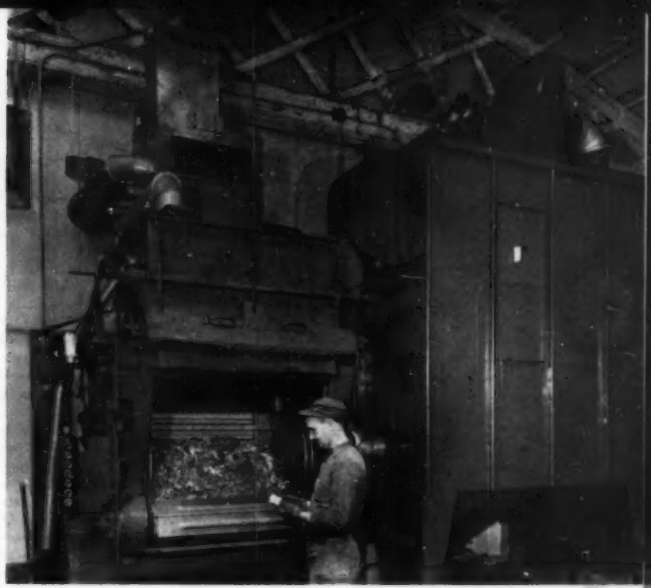
	Service Factor		
Dust Systems	*Extreme*	*Heavy*	*Moderate*
1. Straight Pipe to 30" dia.	3/16" PL	10 Gauge	16 Gauge
2. Straight Pipe over 30" dia.	3/16" PL	10 Gauge	14 Gauge
3. Fittings to 30" dia.	1/4" PL	3/16" PL	12 Gauge
4. Fittings over 30" dia.	1/4" PL	3/16" PL	10 Gauge

Fume and Gas Systems	*Heavy Corrosive*	*Moderate*
1. Straight Pipe to 18" dia.	.....	16 Gauge
2. Straight Pipe to 30" dia.	11 Ga. or 1/8" PL	.....
3. Straight Pipe 19" to 36" dia.	.....	14 Gauge
4. Straight Pipe over 30" dia.	3/16" PL	.....
5. Straight Pipe over 36" dia.	.....	12 Gauge

EXHAUSTED

as that industrial exhaust system continues to function properly or, in other words, is *properly maintained*.

However, it is only too frequently that management invests substantial capital in good control equipment and then, through complacency, lack of understanding or otherwise, proceeds to forget all about it.



The primary function of exhaust equipment is to protect the health of workers. This means that the equipment must be frequently inspected and well maintained.

Good Maintenance

Good maintenance in our industrial plants today is exemplified by that maintenance which is accorded production equipment. This quality of maintenance is what we recommend for the industrial exhaust system. In an asbestos mill in Canada, we have seen a good example of exhaust system maintenance. Here, where the possibility of asbestosis, a hazard similar to silicosis, is always present, their maintenance program is sound and systematic, assuring employees of the safety they deserve. This maintenance program is four-fold and tied in with the entire plant maintenance plan. Here the exhaust hoods are checked daily to determine the suction of each hood, every inch of the lengthy sheet metal duct system is checked through the day for stoppages and leaks; the exhausters, motors, drives and other machinery are checked along with their production machinery of the same class; and the dust collector receives constant daily attention from the one man assigned this specialized duty. The industrial exhaust system here handles approximately 500,000 C.F.M. of dust laden air per minute and is, naturally, one of the major items of equipment in this plant. Also, this equipment is tied into the production of asbestos fiber in the use of air for separation, grading, conveying and the like. But notwithstanding a large unit and a part of their productive scheme of things, other plants having the equivalent in equipment to this example are ignoring its maintenance today.

Design Features

The primary consideration for good maintenance should be design. Good engineering design assists in maintenance by eliminating and/or simplifying the maintenance problem. Major among the design features which affect maintenance are: (a) Selection of proper duct velocities, (b) Design of the piping and piping system, (c) Selection of equipment.

Proper selection of duct velocities is necessary in order to maintain the dust or fume in proper suspension. Numerous incidents of exhaust pipings becoming filled with dust which settled out and then crashed to the floor to cause accidents, damage to other equipment, and confusion have been reported. It is not enough to design the hangers so that such an occurrence is out of the question! A build-up such as just described means *one thing*—the health safeguard that capital investment and proper engineering have provided is no longer there. But likewise, the velocities cannot be excessive as this increases the wear at critical points.

The piping design should be such as to eliminate, wherever possible, the points where dusts may settle out because of turbulence, impingement, lower velocities, centrifugal action, etc., as well as wear points such as elbows. Adequate wear plates, adjustment features, inspection covers and cleanouts must be included to permit proper maintenance. Also, we recommend angle ring flanged piping connections on all questionable pieces, if not

Chart #2

	General Service
Straight Pipe 12" dia.	18 Gauge
Straight Pipe 13" to 32" dia.	16 Gauge
Straight Pipe over 32" dia.	14 Gauge

Fittings—2 gauges heavier than the straight pipe of same diameter.

throughout the entire system, to facilitate removal for repairing. Elbows should be of a large throat radius of 1½ to 2 diameters to eliminate wear and resistance. Proper selection of equipment also has an important part in the maintenance picture. Size, construction, design simplicity and intended service of the equipment in question must be compared with the application.

Construction Features

Following the design and closely related thereto is the construction of the Exhaust System. Primary among the construction factors to consider are: (a) Heavy construction and material selection, (b) Accessibility for inspection, (c) Protection for maintenance personnel, (d) Mechanical features.

Use heavy construction throughout on your industrial exhaust system. This practice assures greater life to your duct system, less vulnerability to accidental damage and, naturally, less maintenance. Investment-wise, too, it's sound although up in the initial cost phase. Where the service is unusual, special materials must be used as for the handling of corrosive fumes. Either use a corrosion-resistant metal, or paint the inside of all piping, hoods, air cleaner or collector with resistant paint and renew annually or before as required. Our recommendations for selection of sheet metal for ducts are shown in Chart #1.

Present-day practice among competitive fabricators runs somewhat lighter as shown in Chart #2.

Accessibility must be provided by proper construction. Generally, the piping system, exhauster and dust collector are located well off the ground or floor level and are not readily accessible for inspection. The points requiring regular daily and weekly inspection, in particular, need construction planning to permit this accessibility and insure maintenance inspection.

And with accessibility must be protection. Since the points of a system are generally well-elevated and the testing procedure we will recommend will require the workman's attention, protection by means of strong railings, sturdy platforms and the like are necessary. Here again, proper and scheduled maintenance will be enhanced.

Any mechanical features incorporated into the system's equipment must be sturdy and simple. Such things as doors on swing grinder booths, adjustable hoods and other devices that are used by the workers have a distinct tendency to get out of order and thereby materially affect the efficiency of operation as well as requiring constant maintenance. To remedy this calls for maintenance by proper construction.

Due to numerous changing factors, the design and construction of the exhaust system cannot always incorporate every maintenance-saving feature. Therefore, the maintenance program must include a study of the system during initial operation to recommend additional cleanout door locations, additional wear plates or replaceable fitting and any other design or construction feature which will enhance proper maintenance.

The establishment of a maintenance inspection schedule for each and every industrial exhaust system in operation cannot be done by setting down a series of hard and fast rules. Here we wish to present a fairly broad schedule and to anticipate that your development of this into a firm schedule for your own system or systems will come from your particular experiences, common sense and present plant maintenance program. As an example, where toxic dusts or fumes are the problem, the air flow at each hood should be checked daily, whereas this would not, of necessity, be required when the dust was only of the nuisance class.

The first inspection of an industrial exhaust system should be immediately after installation. This is the acceptance test and determines whether or not the installation meets the design specifications and provides the control required. After the final adjustments have been made and the operation of the exhaust system is acceptable, a final set of readings should be taken and made a matter of record. This then becomes the *operational standard* against which all future tests taken during operation are compared for determining the efficiency level at which the system is operating.

In the above schedule for maintenance, we have indicated that air sampling should be done at significant operations and *(To page 54)*

Chart #3—Inspections

Daily or Weekly

1. **Measure the static pressure at indicated points throughout the system.**
2. **Compare these readings with the operational standard and remedy any deficiency indicated.**
3. **Clean and inspect air cleaning equipment (dust collectors). Includes emptying hoppers, inspecting filter media and mechanical devices.**

Weekly

4. **Inspect and clean all hoods and ducts. Remove any accumulations or build-ups in hoods and piping. Check supports and general condition of hoods and piping.**
5. **Dust collectors should be inspected for leaks and wear. Check condition and position of such safeguards as baffles, spark screens, inlet and outlet dampers, electrical controls.**
6. **Fans and motors should be lubricated and checked for belt wear and adjustment, vibration and bearing wear. Inspect fan blades for corrosion or unbalance.**

Monthly (or as required)

7. **Test efficiency of exhaust system as accomplished for final acceptance plus collection efficiency of dust collector.**
8. **Replace worn sections of pipe and damaged dust collector filter media.**
9. **Paint any parts of system with corrosion-resistant paint if required.**

Quarterly or Annually

10. **Check proper rotation of fan.**
11. **Take air samples at significant operations.**
12. **A complete inspection of the system, overhaul and clean-up should be accomplished annually.**

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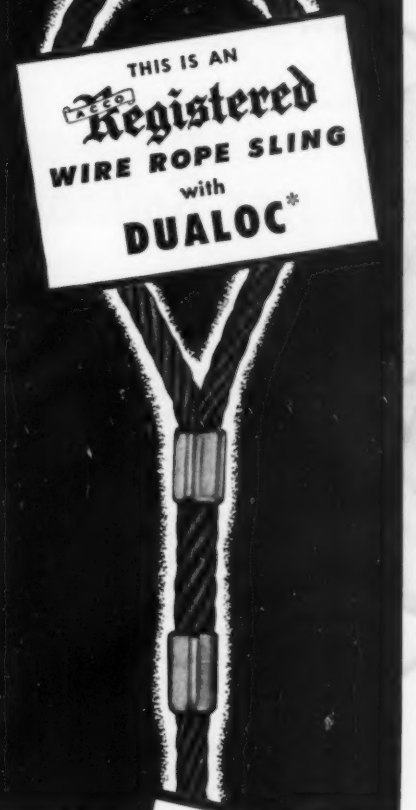

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The tub-shaped boom-boat is sturdily built to withstand the shock of continued bumpings against big logs. Low in height, its deck provides a convenient working platform.

By ALBERT ARNST
Weyerhaeuser Timber Co.
Tacoma, Washington

Water Bulldozer for Herding Logs

A new type of boom-boat is being used for the formerly dangerous job of herding logs.

ONE hundred horses hitched to a sixteen by eight foot steelshod package of stalwart Douglas fir are winning the plaudits of safety engineers as well as loggers.

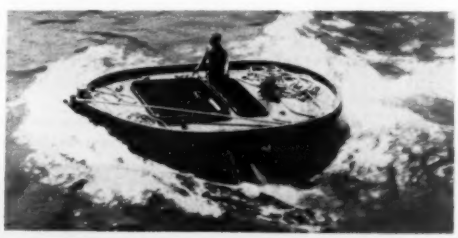
It's being done by a new-type power-packed water craft which is also gaining the admiration of old-time boom-men in the logging industry. The husky newcomer is literally pushing its way around in the closed fraternity of proud river men—and getting away with it.

When logs fresh from the forest are dumped into log ponds, they immediately become a vexing problem in water transportation. They must be guided into various lanes for mill consumption at integrated wood processing centers, shunted directly to the log haul of a sawmill or bound into rafts for further transportation.

It takes the sweat and back-breaking strength of many agile boom-men, perched on the above-water log side, to guide the bobbing logs into place with pike poles. There is always the risk of an accident, when men are beaver-busy with their log pushing poles. Some of the heavier species, like hemlock, also have a bad habit of sinking. The log jostling problem is aggravated where river currents, tides or stagnant waters work against the combined efforts of a large crew of these sure-footed calk-booted log "herders."

In early 1949, millmen at Weyerhaeuser Timber Company's Longview, Wash. branch operation decided to short-cut this important milling operation. They knew that Harold C. Hanson, Seattle naval architect, had designed a boat for "log-herding" use on the Frazer River in British Columbia. Arrangements were made to obtain a set of plans from him.

The specifications for such a boom-boat were *(To page 44)*



The squat boom-boat can turn within its own 16 foot length. It is able to wheel about quickly and catch errant logs.

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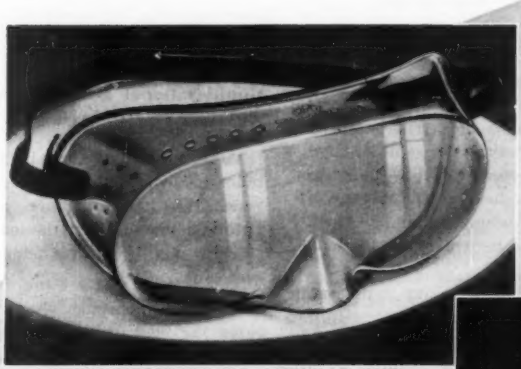

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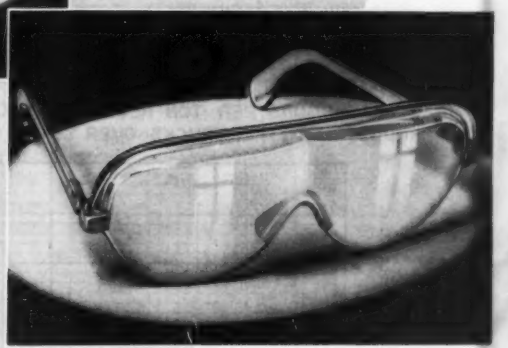

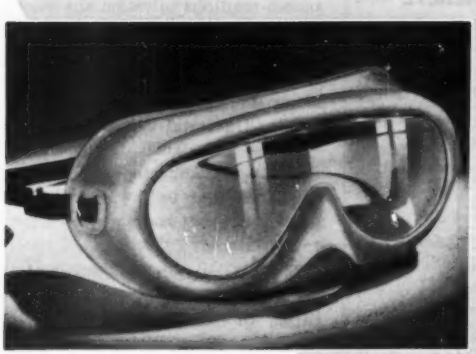

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WHAT SIZE BATTERY DOES YOUR INDUSTRIAL TRUCK NEED?

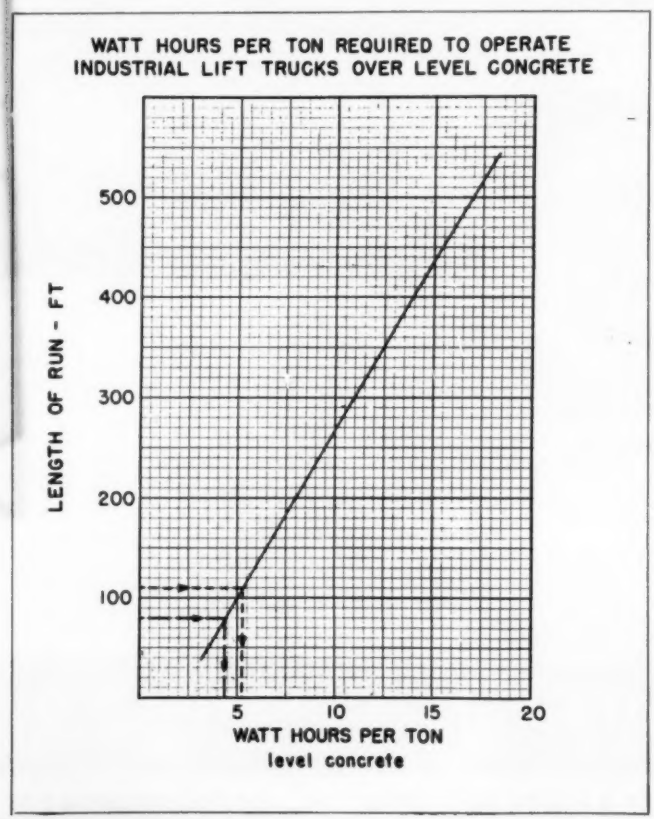
For economy in the maintenance of industrial trucks, you should know how to determine the battery requirements for given applications.

By J. E. VAUGHAN
Supervisor Field Engineering
Gould-National Batteries, Inc.
Trenton, N. J.

DETERMINATION of capacity of storage batteries which power electric industrial trucks require is often left to the truck supplier, the battery representative, just plain guess, or duplication of present batteries. However, there is an engineering procedure, which, if followed, will enable the purchaser to correctly specify his own battery requirements or check suppliers' recommendations. In addition, these calculations will prevent the purchasing of under-capacity batteries which run down before the end of the shift, or conversely, over-capacity batteries calling for unwarranted initial cost.

To illustrate the procedure for determining industrial truck battery capacities we will assume a typical case—a 3,650 lb. truck, 2,000 lb. load, 3 ft. average lift, 110 ft. average haul and 30 ft. 10% grade to be traversed by loaded trucks.

It will be necessary to determine the power (watt hours) required to traverse the average haul distance loaded, climb the grade, traverse the haul distance empty (grade deducted), lift the load for stacking, and tilt the mast for load-centering.



The accompanying chart indicates the watt hours per ton required to move a truck along a given length of *level* run. We can use this graph to determine the power required to travel the average haul distance. By following the dotted lines we see that 5.4 watt hours are required to haul 1 ton along the 110 ft. haul of our example. Our total load is 3,650 lb. (truck) plus 2,000 lb. (load)—5,650 lb., or 2.825 tons. Multiplying 2.825 tons by 5.4 watt hours gives 15.25 watt hours required for the level run.

We can determine the watt hours required for going up grade (in addition to that required for level running) by using the formula: watt hours = tons (truck plus load) x ft. (length of grade) x grade (per cent) x .013 (a constant). 2.825 tons x 30 ft. x 10 x .013 = 11.02 watt hours (extra power for grade).

Then to calculate watt hour requirements for the empty return trip, deducting the grade, we have the 110 ft. total return distance less the 30 ft. of grade, or 80 ft. Again using the graph (dashed lines), we see that 4.4 watt hours are required per ton on the return trip. As the weight is now 1.825 tons, we multiply 4.4 watt hours by this figure

getting 8.03 watt hours.

To determine the watt hours required for lifting, we use the following formula: watt hours per lift = tons of load x ft. of lift x 2 (a constant). Thus, 1 ton x 3 ft. x 2 = 6 watt hours required to lift the load. (For unstacking, the following formula applies: watt hours per lift empty = ⅓ load capacity in tons x ft. of lift x 2.)

To determine the energy required to tilt the mast, we use the following formula: watt hours per tilt loaded = tons of load x 1 (a constant). Thus 1 ton x 1 = 1 watt hour per tilt loaded. (Watt hours per tilt empty = ⅓ load capacity x 1.)

Summing up we have:

	watt hrs.
Run with load, no grade	15.25
Extra power for grade	11.02
Run empty, grade deducted	8.03
Power required per lift	6.00
Power required per tilt	1.00
Watt hrs. per trip	41.30

Assuming 250 trips per day, a total of 10,325 watt hours of battery power are required. If we select a 32-volt battery, as recommended by truck manufacturers for this size truck, it must have approximately 323 ampere hour capacity. (Ampere hours equal watt hours divided by volts, hence the ampere hours required equals 7,597 watt hours divided by 32 volts or 323 ampere hours.) Battery manufacturers' catalogs give ampere hour capacities of various sized cells.

By following this procedure, the purchaser can effect economies which will be reflected in multiple since future purchases of batteries for given applications will be based on original computations.

Formulas used are from the Handbook of Material Handling published by the Electric Industrial Truck Association, 1950.

What's New?
See pages 72–74
Free Bulletins & Catalogs
See page 75

Civil Defense Film

"TARGET, U.S.A.," a dramatic guide for industry planning and preparation in the event of an atomic attack, has been completed and will begin immediate release by Cornell Films, the organization which sponsored the prize winning documentary on the same subject, "Pattern For Survival," which was projected on a home and personal level.

The film runs 20 minutes and was written and directed by Herman Boxer, formerly of M.G.M. It is in full color and was filmed on location with a cast of professional actors.

Hanson W. Baldwin, noted military analyst and editor of the New York Times, is featured as special writer and commentator. "Let me put it simply and plainly," Mr. Baldwin warns the audience, "we can be attacked on our own home grounds. Modern air power makes us as vulnerable today as London was in World War II. We must be prepared for the same kind of fire bombs, block busters and buzz bombs that those cities got—plus what Hiroshima and Nagasaki got, the atomic bomb.

"In the dread possibility that it might happen," Mr. Baldwin continues, "there are things to be done now—insurance measures to be taken against that possibility. The need is for intelligent basic planning on which to build a civil defense program at the industrial plant level—to include office buildings, hotels, hospitals, railway installations as well as factories."

Based on studies made by the National Security Resources Board with the assistance of the Department of Defense and the Research Institute of America, "Target, U.S.A." is a graphic demonstration of industry and personnel in action prior to and under an atom bomb attack. The film utilizes live action, animation, charts, graphs and other Hollywood techniques to illustrate practical defense in terms of plants and personnel. With running commentary by Harry Marble, "Target, U.S.A." answers such basic problems as how to protect people and property, how to build up effective plant-wide defense, how and where to build and allocate shelters, how to recruit a Defense Corps, how to set up first aid stations, how to safeguard important records, and what management and labor can do right now to set up protective measures against the possibility of an atomic attack.

Cornell Films will distribute "Target, U.S.A." in both full color and black and white to industry, national, state and local Defense Corps units, schools, unions, business groups and associations, fraternal and patriotic associations.

Unsafety Unpopular

HONORING a 15-year accident-free industrial safety record, the American Petroleum Institute recently presented its Accident Prevention Award to personnel of the Sun Oil Company Automotive Laboratory in Marcus Hook, Pa.

The A. P. I. award is given only when an industrial unit reaches one million man-hours without a disabling injury.

In congratulating the automotive laboratory staff, Robert G. Dunlop, Sun Oil president, in a letter read by Dr. John R. Bates, Director in charge of Research and Development, pointed out that the laboratory had reached the A. P. I. goal early this year and that the no-accident record continues unbroken.

Mr. Dunlop called it a "most notable achievement," indicative of the keen safety consciousness that has existed among the laboratory workers for the past 15 years.

Dr. J. Bennett Hill, director of the Chemical and Engineering Division of Sun's Research and Development Department, told members of the laboratory staff that their greatest accomplishment has been to build up a sentiment for safety. "You have made 'unsafety' unpopular," he said.

The Maintenance Problem of the Small Plant

. . the *Where*, *When* and *Who*

Continued from the August 1951 issue of SAFETY MAINTENANCE & PRODUCTION

By W. C. ZINCK
Plant Manager
Arbogast & Bastian, Inc.
Allentown, Pa.

WHERE is the maintenance problem of the small plant? The WHERE of maintenance is the same in a small plant as in a large plant. At any particular moment maintenance is required:

1. On equipment that has had a breakdown; no questions asked, just get it going.

2. On equipment that preventive maintenance inspection has indicated needs adjustments and/or repairs.

3. On equipment that should be repaired because it is reported as not giving dependable production or service operation.

4. On equipment scheduled for repair because its hours of service has reached the point where an overhaul is most economical.

5. On equipment scheduled for overhaul during the next regular shutdown period; the end of the day, the weekend, the end of the month, the semi-annually or annual shutdowns for repairs.

6. On equipment released by production or service for repairs because of an actual, unplanned lull in production or service requirements.

The Maintenance Department is notified as to WHERE by requests from preventive maintenance inspectors, production supervisors, service supervisors, and the follow-up clerk in charge of the Equipment Record.

WHEN Is Maintenance Required?

When is there a maintenance problem in a small plant? The WHEN of maintenance is the same for any plant. These factors fix the WHEN:

1. An emergency breakdown of production or service equipment must be fixed at once.

2. The system of preventive maintenance inspection will uncover adjustments, minor repairs, and all too often major repairs that need to be done within definite time limits.

3. Production equipment should be repaired as soon as possible when the quantity and/or quality of production falls below standard, and will be made when the excess costs of production finally overrules the need for production.

4. The continuing record of maintenance costs will show clearly when major maintenance work should be done in order to prevent excessive maintenance costs later on.

The very nature of the basic cause of maintenance work, namely, deterioration in varying degrees immediately upon installation, creates a WHEN of maintenance. Combined with the deterioration factor, is the wear and tear in varying degrees from actual use to hasten the WHEN and to complicate the problem. The Equipment Record dictates the WHEN of inspections and overhauls. Production and service supervisors specify the WHEN of emergency repairs and requested repairs. Careless and inefficient operation cause WHENS that allow little or no time for planning and scheduling. Careful and efficient operation create WHENS that can be integrated economically with the inspection and overhaul WHENS.

WHO Has the Problem?

WHO has the maintenance problem in the small plant? There are differences between plants in WHO handles the maintenance problem. As noted, the Why, What, Where, and When are identical in the maintenance of similar equipment in any size establishment—a machine running 24 hours a day needs the same attention whether it be the only one of its kind in a small plant or one of a battery of 50 in another plant.

The WHO of maintenance differs between plants depending upon the nature of the products produced. Certainly the maintenance personnel in a meat packing plant with its power generation, its refrigeration equipment, and its relatively larger building maintenance is not the same as the personnel in a hearing aid plant with its machine equipment, its light assembly equipment, and its smaller floor area.

The WHO of the permanent

maintenance personnel differs with the complexity of the maintenance problem. General all-around mechanics form the bulk of the personnel for plants with equipment of a general mechanical nature and the usual building construction and services. The specialists for specific equipment, welding, or paper making, or furnaces must be kept on the payroll because when they are needed they are really needed. Their intuitive know-how saves minutes, hours, and days of valuable production time. I'm told that the chief fixer-upper of a pulp and paper mill is the best dressed man, *and the best read man in the plant.* One such man was asked why he wasn't working. "Well, you see, Mister," he replied, "When I'm working the company loses money—but fast. When I'm not working, the company makes money."

The WHO of maintenance differs as to its supervision according to the degree of specialization thought to be necessary for overall, low cost operation. Where management places the responsibility for continued production, there management also places the WHO of maintenance. It is hardly conceivable that the Hog Kill & Cut Foreman in a meat packing plant should supervise the maintenance and operation of the coolers and freezers, whereas the general foreman of a major assembly department might well insist upon and be allowed to have departmental repair men to handle adjustments and make minor repairs. Thus, the WHO of maintenance supervision depends upon who gets the blame or criticism for low volume, high-cost, and poor quality production of the product or service sold. That production man will insist upon and have general supervision of all possible maintenance work that has a direct bearing on production. Management will force all maintenance under a single maintenance man only when the cost of maintenance becomes a factor comparable with production, costs, and quality. However, there is always maintenance work that any production man is quite willing for a maintenance department to handle completely because it has no direct, day-to-day bearing on production, costs, and quality. Specifically, the maintenance of a battery of automatic screw machines versus the operation of the heating system.

The WHO of maintenance of the small plant changes from the general handy man who assists the shop foreman in the up-to-50-man plant supplemented by outside contract work for major repairs, through a general maintenance group plus outside contractors and departmental repair men in the next discernible group, to the full maintenance department with complete responsibility for all maintenance in the 1000-man plant.

To summarize, the WHO of the maintenance of a small plant will depend upon:

1. *The basic urgency* *(To page 57)*

37
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*17% of the 222 occupational injuries which occur every hour are due to falls. Source: National Safety Council's 1949 edition of Accident Facts.

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TRANSPORTATION

Instructors Courses

THE American Association of Motor Vehicle Administrators has announced a series of four regional training courses for instructors of driver license examiners. The courses will be conducted for the AAMVA by the Traffic Institute of Northwestern University on college campuses in the East, Midwest, South, and West, beginning in September.

First course will be held September 17–28 at Northwestern University, Evanston, Ill. This will be for examiner-instructors of driver license agencies in Region III of the American Association of Motor Vehicle Administrators. Others are scheduled for October 15–26, Northeastern University, Boston, Mass., for Region I; November 5–16, University of Alabama, University, Ala., for Region II; and December 3–14, University of California, Berkeley, Calif., for Region IV (this course will be conducted at University Extension Center, San Francisco).

"The purpose of these courses is to provide professional instruction for the men charged with the training of new personnel for the very important jobs of driver license examiners and for carrying on in-service training and refresher courses," said L. S. Harris, executive director of the AAMVA, in announcing the courses.

"This type of training has never before been offered, and we are pleased to make this service available to driver licensing agencies. In so doing we are helping to effect one of the major recommendations of the President's Highway Safety Conference—that of providing professionally trained personnel for traffic safety work.

"We know that professional training will yield superior results at less cost to the taxpayer, and the results in this case represent lives saved and injuries prevented."

The regional courses are offered for any state or local governmental agency which has the responsibility for examining drivers for licenses. Emphasis in the courses will be on teaching techniques, rather than on examining procedures. There will be no tuition charge, and there is no limit to the number of representatives an agency may send to a course. Each agency will pay the travel and living expenses of its representative while in training. Each course will have 60 hours of instruction during a two-week period.

Further information about the regional training program may be obtained from the American Association of Motor Vehicle Administrators, 912 Barr Building, Washington 6, D. C.

18,000,000 Accident-Free Miles

This is the outstanding record set by 47 Fisher Body drivers, who have had 10 or more years of accident-free driving and recently were honored by the National Safety Council with the presentation of safe-driving awards. Top three shown here, all of whom are from Detroit, alone account for 1,700,000 miles of the amazing total. Driving some 25,000 miles annually, each has a perfect 23-year record in piloting trucks carrying completed bodies, sub-assemblies and parts for General Motors automobile body-building division. Ben I. Bielski (upper left) believes in observing the Golden Rule. He says, "Courtesy—consideration for the other fellow—is the way to keep out of trouble". Julius Wiest (upper right) cautions "not to crowd — let the other fellow go — and always keep your distance." William Lawrence (lower right) advises motorists to "let prevailing conditions govern speed and obey traffic laws" if they wish to avoid accidents.

WANTED?

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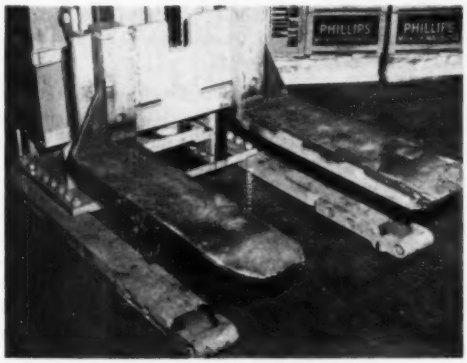

This picture shows a plant-devised attachment used on the battery-electric-powered-handling and stacking trucks. An additional flange of metal, welded the full length of the truck's pallet-handling forks, spans the truck's wheel-carrying forerunners. The extra width of metal affords greater lifting surface for truck and stability to pallet and load.

PALLETS AID TRANSPORTATION and WAREHOUSING

A drug manufacturer found that careful pre-planning of mechanized handling of unit loads offers increased efficiency and economy.

WITH the object of achieving better warehousing at its factory in Glenbrook, Conn., and also in an attempt to lower its interstate shipping costs, the Chas. H. Phillips Co., Division of Sterling Drug, Inc., within the past two years began to use expendable wooden pallets and storage battery-electric-powered industrial trucks in the handling and movement of unit loads of its line of products. This consists of, for the most part, pharmaceutical items such as milk of magnesia both in liquid and tablet form; milk of magnesia emulsion; face creams and also shoe cleaners and whiteners and a line of cleaning fluids.

According to R. Ross Kitchen, manager of the Glenbrook Plant, considerable savings in man-power, man-hours and money, accrued to the company during 1950—the first full year of fully mechanized material handling operations. It was Mr. Kitchen who, assisted by the heads of the receiving and shipping departments at the Glenbrook plant and with the co-operation of certain of the firm's suppliers, devised the methods that have shown profitable results.

The use of industrial trucks and pallets for warehousing purposes had been practiced at the Glenbrook plant since 1946, a mechanized stacking truck having been installed that year. However, for the purpose of securing the safest and cheapest way of shipping between the plant and Phillips' warehouses in various parts of the United States, a study of methods was initiated. The findings were that if several of the firm's shipping cases were re-designed they would be better adapted to palletizing, while for over-the-road haul by motor carrier, an expendable pallet of standard size could be used. This latter was necessitated both for initial cost and for the difference in shipping weight.

"In re-designing our shipping cartons," Mr. Kitchen said in a recent interview, "we worked with

A 45-case unit load, made up on a wooden, expendable pallet, is moved aboard an over-the-road motor truck by means of a pallet-handling industrial truck. For the purpose of creating a "tight" unit load, those intended to travel at the front and rear of the truck receive a vertical round-the-load wiring in addition to horizontal ties on the first and the third layers. Considerable savings in manpower, man-hours, and money have accrued since this carefully engineered method of handling and shipping the company's product was developed by plant officials.

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the companies supplying our glass containers. Our 26-ounce liquid bottle case, together with the 75-tablet bottle case, and the eight-ounce, pint and quart bottle cases were re-designed to the following dimensions, respectively: 18x10½x10-inches, 19x7½x5-inches, 16¼x9x6-inches, 16¼x9x9-inches and 15x8x10½-inches. This re-design, together with a re-arrangement, or change in the manner in which certain of the bottles are packed, permits palletizing the cases either on 32"x48", or 36"x48" pallets." These latter are made of wood and are single-faced, permitting the use of the battery-electric-powered equipment installed at the Glenbrook Plant.

Pallets Re-Used

Mr. Kitchen went on to say that some suppliers of raw and packing materials ship to Glenbrook on expendable pallets. "On these we share the cost of the pallet and re-use them for our own shipping," he said, adding, "Thus both the supplier and the Company gain the advantages of palletization at reduced costs."

"In shipping by motor truck to our warehouse in Wheeling, W. Va., we have an arrangement whereby pallets are returned to us in truck loads by the carrier. This, under favorable conditions, means that we can re-use the pallets three or four times, with still further economies," Mr. Kitchen said.

Efficient Use of Trucks

In order that the most effective use of pallets can be realized, constant experiments are being made with the plant's fleet of battery-electric-powered pallet-handling trucks, both the stackers and the lowlift type intended for horizontal movement of loads. Three high-stacking pallet trucks powered by storage batteries are used, and four horizontal movement, pallet-handling, trucks. One plant-devised attachment has been worked out for the stacking trucks. This consists of an additional piece of metal attached to the elevating mechanism above the truck's forks. This also spans the extension bars which carry the forward wheels of the trucks. The extra pieces of metal afford greater stability to the pallet's deck when the pallet is raised from the ground. Load capacity of the stacking trucks is 4,000-lb. at an elevation of five feet, while the horizontal movement, pallet-handling trucks each have a capacity of 2,000-lb.

"Our latest endeavor to cut costs is to have fresh stock ordered by the warehouse in unit loads, with a schedule of the manner in which we build unit loads as the working base for the orders," Mr. Kitchen said. "In some of our loads we alternately layer large and small size cases, with the latter 'sandwiched' between the large cases. This aids to hold the loads together. We are working out the number of units in each pallet-load for our various items of product, and plan to warehouse them to await requisition in these pre-determined quantities. We believe that the work of order-filling and inventory will be made much easier, both here at the manufacturing plant as well as in the warehouses."

In discussing some of the savings realized since the use of pallet-handling trucks and the receipt of shipments from suppliers in palletized loads, Mr. Kitchen said that the Company has derived considerable benefit, especially in the matter of man-power. Under former manual methods of pick-up and deposit to make pallet-loads, it took three men (two loaders and a helper) between one-and-a-half and two hours to empty a freight car. Receipt of the same items on pallets now requires one man and a helper only from 20 minutes to a half-hour to unload the car and warehouse the contents.

"We have been able to cut manpower in our receiving department by 50%," Mr. Kitchen said. "This has been a boon because we have been able to re-assign badly needed abor into productive work elsewhere in the plant. This has meant that production not only has increased,

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but that more goods are handled. The greatest use is made of the cubic capacity of our warehouse as well, all without increasing the number of persons on our payroll. At the same time workers have been advanced in their gradings and have been relieved of monotonous, and often back-breaking, work of repetitious handling."

Loading System

Palletized loads in shipment are built from five to six layers high. The highway trucks carry as much as 25,000-lb. loads in one trip. The first and third layers from the top of the unit load are wired horizontally to add stability to the load. The pallet-loads intended for the front and rear of the highway truck also are wired vertically around the loads at the end cases, this being done to make a more compact load which will absorb some of the shocks of highway travel. According to Mr. Kitchen there has been practically no damage, either to cases or contents, when loads are built up, wired and transported in this manner. Experiments also are being conducted with a view to transport of similar pallet-loads in rail shipment, but these have not been satisfactory for a number of reasons. Among these are the fact that there are small doorways in refrigerator cars that often are used to ship products of the Glenbrook plant; car floorings are not always uniform, or are broken; pallet sizes are not easily adapted to car widths so that savings are consumed by special bracing that is required to insure stable loads, and finally car shunting, jerky stops and starts, all combine to cause load shifting—and resultant damage—to the shipments.

Pictures by courtesy of the Industrial Truck Association.

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Safety Engineer available for the Southeast with headquarters in Florida. Familiar with all phases of casualty insurance including elevator inspections. Address replies to: Box 49, c/o Safety Maintenance & Production, 75 Fulton St., New York 38, N. Y.

Detergent Demonstrations

INDUSTRIAL hygienists and maintenance representatives attending the Sanitation and Safety Show to be held September 11 and 12 at the Essex House in Newark, N. J. will have an opportunity to witness actual demonstrations of First antiseptic liquid detergent. Made by Piatt & Smillie Chemicals, Inc., of St. Louis, the new floor cleaning product will be shown by Formula Floor Products, Inc. of Newark.

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Standardization Conference

THE National Standardization Conference will concentrate on the part standards are playing in national defense when it holds its second annual meeting on Oct. 22–24 in the Waldorf-Astoria, New York. The announcement was made by Vice-Admiral George F. Hussey, Jr., managing director of the American Standards Association, which will hold its 33rd annual meeting in conjunction with the Conference.

Admiral Hussey, who was wartime chief of the Navy Bureau of Ordnance, said that the Conference will report on progress made and steps to be taken in filling the country's need for more and broader standards in engineering, safety, consumer goods and other fields. The theme of the Conference, he said, will be "Strengthening America Through Standards."

"Lack of adequate national standards," Admiral Hussey stated, "has cost the country incredibly heavy losses in the past decade. It has cut the purchasing power of every citizen and lessened the effectiveness of every soldier. If we are to carry out successfully the tremendous civilian and military production program we are now engaged in, we simply cannot afford to continue to lose production and waste manpower, materials, time and money because of lack of standards."

The program committee in charge of the conference is under the chairmanship of Thomas D. Jolly, Pittsburgh, president of ASA and vice-president, Aluminum Company of America.

The American Ordnance Association will be in charge of a session of the Conference on Industrial Standards for Defense Production. Louis Polk, president, the Sheffield Corp., will act as moderator. A session on the use of standards for better purchasing will be sponsored by the Standardization Committee of the National Association of Purchasing Agents. E. H. Weaver, of Los Angeles, manager of purchases, Union Oil Co. of California, and Vincent de P. Goubeau of Camden, N. J., vice-president in charge of material, RCA-Victor Division of the Radio Corporation of America, will develop the program.

A conference of representatives of the 2,200 company members of the American Standards Association will be under the direction of Mr. Kliment and A. J. Beck of the Detroit-Edison Company in Detroit.

The work being done in standards by trade associations and technical societies will be discussed at a session of the Conference of Executives of Organization Members of the American Standards Association. Mr. Donald will preside as chairman. T. E. Veltfort, New York City, manager of the Copper and Brass Research Association, is vice-chairman.

At the opening session of the three-day Conference, W. C. Wagner, of the Philadelphia Electric Co. in Philadelphia, will report on the year's activity of ASA Standards Council, of which he is chairman. Election of officers and new members of the board of directors for 1952 will be announced at this session.

The Conference will close with a luncheon at which the 1951 award of the Howard Coonely Medal will be made. The medal is given annually to a leader in any field who has made an outstanding contribution to national standardization as an instrument of free enterprise. Mr. Jolly, as president of ASA, will make the presentation.

Names of the prominent speakers who will address the luncheon and the opening session in a keynote address have not been announced.

Builder's Program for Safety

THE National Constructors Association, an organization composed of large industrial construction companies operating on a

national basis, announced recently plans for conducting an intensified safety program aimed at making substantial reductions in lost-time accidents on building projects.

The Association is made up of companies engaged primarily in the construction of chemical plants, petroleum refineries and steel mills, and all are participating heavily in the present defense construction program.

F. R. Griffin, Chairman of the NCA Safety Committee, announced that plans are being developed to present an award to member-companies which effect reductions in their safety records on the basis of both frequency and severity. The nine-month period from Jan. 1, 1951, to Sept. 30, 1951, is being used as a period to establish base ratings for each of the members, and the first annual award period will start on Oct. 1.

"Companies can qualify for safety awards by reducing their frequency and severity ratings below those established in the base period," Mr. Griffin said. "The amount of reduction required is now being determined, but we are hoping that with intensified effort on the part of our members, we can effect an accident reduction of approximately 20 per cent the first of the year."

As part of the safety program, National Constructors Association is preparing a standard safety manual which can be used as a safety guide at each job site. At the present time, member companies are working in almost every state of the union on projects whose total cost is measured in terms of billions of dollars.

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N.Y.U. Safety Courses

COURSES in industrial and traffic safety are announced by the Center for Safety Education, Division of General Education, New York University, for the fall term beginning September 24th. The expanded curriculum makes it possible for the students selecting a full program of eleven courses to secure either a Certificate in Industrial Safety or a Certificate in Traffic Safety.

The following courses will be offered in the fall term:

REQUIRED COURSES: Accident Prevention—Its background, Objectives, and Relationships; The Philosophy and Basic Principles of Accident Prevention; Industrial Hazards—Mechanical and Personal. Control Methods; Fire Prevention and Protection Inspection; Organization and Administration of Traffic Safety Programs—Industrial, Community, and Governmental; and Marine Accident Prevention.

ELECTIVE COURSES: Vision in Industrial Safety and Motor Vehicle Operations; Effective Public Speaking; Principles of Safety Inspection.

All courses are given in the evening. For registration information, write to the Center for Safety Education, New York University, Washington Square, New York 3, N. Y.

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I.S.E.A. Elects

THE Industrial Safety Equipment Association at their annual summer meeting held at Skytop Lodge, Skytop, Pa., re-elected Charles H. Gallaway of American Optical Company as president.

Elected to the vice-presidency was Earl H. Brooks of Safety Clothing and Equipment Company. Jess A. Brewer, Industrial Gloves Company, and G. M. Glidden, Acme Protection Equipment Company, were elected to the board of trustees.

Carrying over as board members until next year are Frank R. Davis, Jr., Davis Emergency Equipment Company, and Stanley C. Herbine, Willson Products Company. Lawrence E. Dickson, junior past president, automatically continues as a board member for another year.

Quarterly meetings of the association are also held for the purpose of maintaining high standards of quality, representation and business ethics. To better serve industry, all types of safety products are represented by the I.S.E.A. Inquiries on specific problems of safety equipment are welcomed by the group.

Westinghouse Safety Expert Retires

FRANK THORNTON, JR., engineering manager of association activities for Westinghouse Electric Corporation since 1931, has retired after 42 years with the company. An expert on standardization of electrical equipment and development of safe working practices, he was awarded the James H. McGraw Award in 1950 in recognition of his contributions to the advancement of the electrical industry in the fields of standardization, code development, and safety regulations. Mr. Thornton has assisted in designing, manufacturing, and installing all kinds of electric heating apparatus and has been awarded 47 patents during his career.

Born in St. Joseph, Missouri, on July 10, 1886, Mr. Thornton was educated in the St. Joseph public schools and received the Bachelor of Science degree from the University of Missouri in June, 1908. He then attended the Technical College at Charlottenberg, Berlin, Germany for post-graduate studies.

Mr. Thornton joined Westinghouse at East Pittsburgh in May, 1909, and after completing the graduate student training course, was assigned to the engineering department where he specialized in electrical heating. In 1914 he was made section engineer in charge of electric heating engineering at East Pittsburgh and in 1918 was appointed engineering manager for the new plant in Mansfield, Ohio. He returned to East Pittsburgh as general engineer in domestic engineering in 1930 and one year later was made engineering manager of association activities.

He has been affiliated with many engineering and standardization organizations. Mr. Thornton recently returned from Helsinki and Imatra, Finland, where he represented the American Standards Association at the International Commission on Rules for the Approval of Electrical Equipment.

Water Bulldozer

(From page 32) tough. It had to be small to work in close quarters, of extremely rugged construction, generously powered with a dependable engine and so maneuverable that it could best the efforts of several men with pike poles.

To construct such an unusual craft, the Longview millmen selected the Ilwaco Boat Works at Ilwaco, Washington, owned and operated by Howard Gerttula, who in marine circles had established a reputation for "know-how" and dependable work. Howard went to work on the plans—and his results since then have more than repaid the fondest hopes of the men interested in a new marine craft.

Gerttula knew the rough service required from such a craft and built accordingly. As he remarked, "I built it as ruggedly as for a vessel ten times its size." Nearly all of the frame material was of native Douglas fir, specially cut, selected and partially kiln dried. Air seasoning at Ilwaco finished the curing process. The keel was shaped from 12 x 16 inch fir and the frame from four-inch flitches of fir timber.

Over the heavy fir ribs was placed a double planking of one-inch white oak and over this a sheathing of one-eighth inch steel plate. The bow stem was fashioned from tough iron bark wood from Australia. The iron clad hull is not only a protection against hard everyday service but also equips the boat for ice-breaking service.

Finished, the boat was sixteen feet long with an eight-foot, three-inch beam. It drew 43 inches of water and was built low in the water so that the operator could jump out quickly onto logs when required. The low flat open deck is a convenient working platform and also permits ready clearance under overhead walkways or other obstructions.

The power plant in the first boat and succeeding models is a 100 horse-power marine engine, connected to the propeller shaft through a reduction gear and a hydraulic reverse gear. The 26-inch propeller is protected by a heavy guard to prevent damage when passing over submerged "sinker" logs. These mechanical features gave the new water craft ample power and maneuverability for its man-sized job.

In action, the "five-by-five" bathtub shaped boat belies its clumsy appearance. As the throttled motor roars into full life, the snub-nosed craft leaps into motion. It thrusts its steel-shod nose into a pocket of freshly dumped logs bobbing on the water. With a weaving motion it soon has the logs on their way to the booming pockets or to the sorting lanes leading to mill log hauls. In a shower of spray churned up by the thrashing propeller, the boat turns around within its own 16-foot length and darts back to corral a stray log.

Loggers were quick to see the craft's resemblance to their familiar bulldozer-equipped tractors, used to bring logs to truck landings and to build roads in rugged country. The steel-shod bow is literally the counterpart of a bulldozer blade and does the same husky work—on water. Hitched to a "dead-head" or "sinker" log common in log dumps, the boat performs a valuable pulling function in addition to its customary bulldozing action.

Since the first boat was manufactured in 1949, other units have been added to Weyerhaeuser's armada of water bulldozers. From Coos Bay, Oregon, north to Washington waters, the new water craft is doing a yeoman job of log herding.

Pictures by courtesy of Weyerhaeuser Timber Co.

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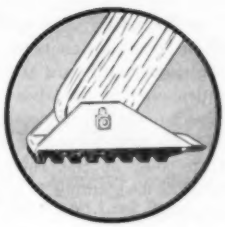

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Fire Protection Institute

THE fifth anniversary of Fire Protection Institute, an agency stressing the importance of "approved" equipment in the fire safety field, was celebrated recently at a meeting of the Institute's Advisory Committee in Cleveland, according to Paul W. Eberhardt, F.P.I. president.

Founded in midsummer of 1946, the Institute's educational program is sponsored as a public service by leading manufacturers in the fire equipment field whose products meet Underwriters' Laboratories or Factory Mutual Laboratories specifications. The operating program is staffed and executed by the Fred Eldean Organization, Inc., national public relations firm headquarters in New York City. The work of the Eldean Organization is supervised by an eight-man Board of Trustees, supplemented by an Advisory Committee on which all member companies are represented.

Objectives of the Institute, as they have been stated in recent literature, are:

1. To increase knowledge of the importance of approval by Underwriters' Laboratories, Factory Mutual Laboratories, Government Departments and Military Establishments for fire protection equipment.
2. To promote knowledge of the various types of approved fire extinguishers and how they should be used.
3. To encourage the development and training of competent private fire brigades in industry, business and institutions.
4. To assist municipal fire departments and local, civic, business and safety organizations in the development of community fire safety programs.

"For the past five years the Institute has performed a distinctive service benefiting the public, other fire safety agencies and its member companies," Mr. Eberhardt declared in announcing the anniversary. "A number of other organizations are doing fine work in specific areas of fire safety but no organization up to five years ago had been giving fire protection the attention it deserved. The need for an organization of this type was more than apparent in our fire loss figures which have continued to rise in spite of current fire prevention programs."

The Institute participates in activities of National Fire Protection Association and cooperates, when appropriate, with the National Board of Fire Underwriters and other groups. Activities competitive with these older organizations are avoided as much as possible.

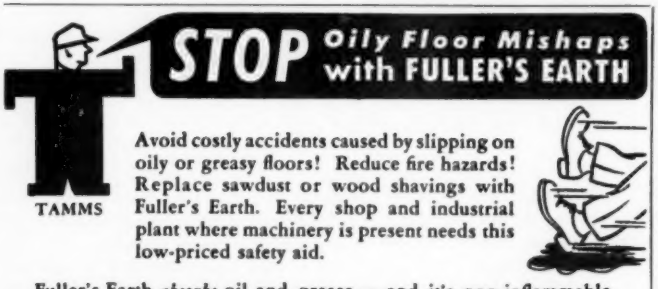
A striking feature of F.P.I. activities has been its success in developing and testing community programs for fire safety. One nationally-publicized program, the Fiery Felix Campaign for Community Fire Safety," was first tested in Syracuse, New York in 1948 and since then has been used in more than a score of towns and cities from coast to coast.

For the past several years the Institute has been attempting to encourage the formation and training of competent private fire brigades. Many brigades, organized during World War II, are no longer active, and the F.P.I. program is aimed at strengthening the national fire defenses in the event of a "fighting emergency."

After field exploration in Yonkers, New York and Newark, New Jersey, the Institute developed a pattern for organizing associations of fire brigades in various cities. The first association was officially organized, with the assistance of Institute personnel, in Atlanta earlier this year. Fire safety authorities in more than a dozen communities have also expressed interest in creating associations of brigades.

The Right Approach

"The usual approach to the problem of getting more brigades under way, is to start out by training everyone and his brother in very formal sessions," Mr. Eberhardt points out. "We tried that route in the beginning but we discovered two things early in the game. The most important thing we discovered is that there is a bond of friendship and craftsmanship among members of existing brigades. They are eager to meet with their opposite numbers in other plants. Give them an organized 'fraternity' of their own and they will not only train themselves but stimulate increased interest in all phases of fire safety. The second thing we discovered is that the delegate from a plant that has no brigade would rather join a 'club' or association of fire brigades than attend a training school. In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other words, we tried to find the correct psychology that would create the greatest amount of interest on the part of industrial and commercial personnel. Then we went out and tested those principles in Atlanta and now we are prepared to expand the brigade association program countrywide."

Another application of the same principle of "finding the right psychology" is illustrated by a special weekly column, "Your Fire Chief Says," prepared by the F.P.I. editorial division. The 300-word column, written so that it can be signed appropriately by the fire chief or fire marshal in any town, covers fire safety topics of general public interest. One week, the high fire loss totals may be reviewed. The following week there may be an explanation of the three basic types of fire and which extinguishers should be used to combat them. The high cost of running the fire department may be discussed the following week.

In addition, it has been suggested to the chiefs who use the column that they can increase its acceptance by "tacking on" items of purely local interest before they submit the material to a home town editor. Nearly 200 chiefs have written in to request this service during the past 18 months.

"The psychology in this project is to give chief's something that will help them with their own public relations, something that will help interpret their job to local taxpayers. So, instead of sending out reams of material written from the 'New York point of view,' every single column is carefully written from the point of view of an average fire chief who has a lot of problems the public doesn't know about or appreciate."

Check Day

Three years ago the Institute pioneered "Check Your Fire Extinguisher Day," and has continued to set aside the Wednesday of succeeding Fire Prevention Weeks as "Check Day." Industry, schools, places of public assembly and fire departments are encouraged to hold demonstrations of fire protection equipment and to capitalize national support of Fire Prevention Week. "Check Day" this year is Wednesday, October 10, and special material, including a three-color poster, is already in preparation.

Fire Protection Institute has also distributed several hundred thousand copies of three editions of a folder entitled "Headlines and Dreadlines" which has attracted national attention. Except for several suggested fire safety rules, the folder avoids text material and consists entirely of reproductions of clippings of serious fires occurring in the United States within a single 24-hour period.

At intervals the Institute has also issued digests of fire loss figures, by classifications and has served as informal consultant to architects, fire chiefs and others.

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The Respirator that is U.S.B. of M. Approved for Type A Dusts
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SAFETY MAINTENANCE & PRODUCTION Salutes a Safety Idea for SEPTEMBER

Elmer Demien, fire inspector, Douglas Dunlop, Wauwatosa Fire Chief and Mayor William Knuese looking at the scale models of various Wauwatosa buildings. Firemen study the models to become familiar with buildings' construction and arrangement.

Previews for Firemen

COMPARED with most mechanical equipment, fire-apparatus spends more time idle than it does in use. But why should it?

Officials of the Wauwatosa, Wisconsin, fire department pondered this question recently and came up with an idea. Now, once a week, the department's new truck rolls out of the station on its way to one of the community's large industrial or public buildings. Aboard is half the fire crew. At their destination they inspect the building from every conceivable angle. They familiarize themselves with the exact locations of hydrants, standpipes—and any special hazards that might exist.

When the inspection period is over, the truck returns to the station, picks up the other half of the fire crew and the procedure is repeated. No hoses are run or ladders hoisted during these special inspection tours. But fire officials are confident that the procedure prepares their men for emergencies because they get a clear idea of the lay of the land in advance.

Assistant fire chief R. A. Gundersen also stresses that these tours do not reduce by one iota the availability of their best piece of apparatus for fire-fighting. Actually, it is ready for fires at all times.

The truck is equipped with a two-way radio. In case of a fire call, the driver touches off the siren, and the inspection party returns to the truck on the run. At the same time apparatus from the station house gets under way. It is quite possible, chief Gundersen points out, that the truck out on inspection could get to the fire quicker than equipment from the station.

Since the station house is always apprised of the truck's location even if the radio failed—which is not very likely—a telephone call to the building would have the truck promptly started on its way.

In addition to these special inspection tours, Fire Inspector Elmer Demien makes standard-type safety inspections of all public buildings about once every three months. Firemen also receive lectures, demonstrations, and drills at the firehouse at regular intervals.

An additional safety educational program, under Demien's direction, is the construction of scale models of public and industrial buildings. The models, built by the firemen, can be taken apart story by story to show the location of hallways, doors, and so on. The models supplement actual inspection tours by refreshing the firemen's memories from time to time.

Picture by courtesy of Mack Trucks, Inc.

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(From page 16) output per machine.

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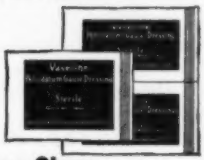

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of wearable machinery parts —such as dies, bearings, cutters, etc.

The fact is that any piece of machinery may show a reduction in *potential* output of from ten to twelve per cent, and even more, unless proper correctives are applied to offset these tendencies; and this vibration which is, in effect, useful and usable energy finds its terminus in the foundation of the building on the ground below. The effect of this waste and that of the worker's efforts, it will be easily recognized, puts a tremendous extra useless "load" on the nation's machinery "plant" at a time when every effort is being strained to produce more, to produce it faster, and to produce it better.

Year by year remarkable progress is revealed in eliminating machine vibration, and, at this time, the topic is of direct and special interest to safety men as well as to the makers and users of machinery. Tests and studies have proved that the proper and scientific isolation of machinery to prevent the transmission of vibration has become one of the really important phases of modern engineering.

Control Through Isolation

In an interview with this writer, Mr. B. A. Doane of the Vibration Elimination Company, pioneers in this field, said:

"Because concrete, steel, and other building materials are all conductors of vibration, all mechanical equipment should be isolated. Properly planned isolation acts not only as a shield to prevent vibration transmission to the foundation, floor, the building structure and surrounding equipment, but it also materially reduces dynamic bearing loads.

"When any machine is rigidly mounted upon a solid support or foundation, vibration loads are added to the normal operating loads. These combined loads are frequently of such magnitude as to definitely increase the wear of moving parts. The cushioning effect of isolation permits all parts to operate freely, with a resulting reduction in wear.

"Effective isolation is not the mere interposition of a resilient material or system. Incorrectly applied isolation may even aggravate the vibratory condition. To be of any value the isolation material or system must be resilient under the condition of installation; that is, under the impact of operation, it must have a certain predetermined action.

"Briefly, if the isolation system is under-loaded it cannot be resilient. Its reaction will be the same as that of a solid mass, and it will transmit vibration. At the other extreme, if the isolation system is overloaded, fatigue results, with a complete breakdown of the resiliency factors. It is clear to the trained engineer, therefore, that the isolation material must be properly loaded for maximum iso-

lation efficiency. Isolation cannot be purchased by measuring the base or foundation and ordering so many square feet. In practically every instance the isolation material will be definitely underloaded and virtually useless."

Of course, it is a well known fact in the machinery field that a blanket recommendation for isolating any and all types of machinery is impracticable. Yet, as has been pointed out, each job doesn't necessarily have to be a "tailored" one thanks to improvements in modern methods of isolation. The present wide selection of unit isolators brings to the machinery manufacturer or user a choice of vibration eliminators all designed to remedy that most common factor—"under-loading." Not only do these modern isolation units make it possible to "control" the load, but their installation is an extremely simple matter under proper supervision, based upon experience.

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Rubber Isolators

To a great extent rubber has become the basic factor in designing and building the new range of vibration isolators which today can be adapted to meet any need. It should be remembered, however, that rubber does not have elasticity by *volume*. For this reason, rubber under compression evidences resiliency only by bulge around the edges, and is limited in use as vibration eliminator. However, the vibration isolation engineer today utilizes the full advantage of the natural elasticity of rubber by employing moulded rubber or rubber bonded to metal both having cross sections that permit them to act freely in shear. This same principle of rubber-in-shear has been used to develop a variety of unit isolators having provisions that permit bolting to a machine and also the supporting structure.

The problem of resiliently supporting small loads ranging from a few ounces to several pounds presents difficulties not found in handling heavier loads. In overcoming these difficulties, no isolation material has proved more effective than rubber. Because of this effectiveness, isolation engineers have developed a wide variety of designs using rubber-in-shear for resiliency and rubber in compression for stability, thus enabling the application design engineer to consider the particular problems of installation when selecting the units for the job.

The application or adaptation of these standard units and the conception of new designs for special jobs is a large part of vibration isolation engineering today, and eliminates the possibility of overlooking local conditions peculiar to a specific job, which exist when an attempt is made to select mountings from a catalog.

Cork Isolators

Cork, too, has its place in modern vibration elimination. Natural cork plates call for the same accurate loading for maximum efficiency as do other systems of isolation. The table of loadings that has been calculated for these other systems may be used just as successfully for natural cork plates. Results are greater efficiency and lower cost. Cork plates are made from a pattern of strips of pure natural cork with a steel confining frame. Natural cork plates may be installed under conditions where they are in continuous contact with oil without losing their efficiency.

Rails

The use of vibration eliminator rails for certain types of machinery has greatly increased. These rails are supplied both in rubber-in-shear and in cork.

Both designs are convenient and effective, since they are supplied in lengths to meet conditions, and the built-in isolation units are located according to the distribution of the weight of the machine. These isolation units are metal-housed and locked in place. The housing provides a level bearing surface on the cork or rubber. Rails are drilled and tapped for machine foundation bolts with ample threading surface. Where driver and driven are not on a common base or where the machine base itself needs continuous support, the rails provide this necessary base and support. These rails also help to distribute the weight over the floor area since the bottom member extends the entire length of the rail. Installation is relatively simple as extending lugs at the ends of the rails are drilled for lagging to the floor. The cork rails are used where contact with oil is possible. The rubber rails are recommended where the supporting structure is not rigid.

Today, vibration of industrial machinery is a known factor, and its results on personnel are a known fact. Modern engineering has given increased attention to this important production-man-

agement question, and the results of the modern engineers' work has been realized in the design and manufacture of greatly improved and flexible vibration isolators now at the service of the nation—at a time when every possible effort and every possible potential is vitally needed for the Defense Program.

Mine Rescue Contest

THE National First Aid and Mine Rescue Contest—first of its kind in twenty years—will be held in Columbus, O., on October 2, 3, and 4. Competing for national honors will be teams from all minerals industries, including coal, metal, and non-metal mines; petroleum fields and refineries; and mills, smelters, and quarries.

The contest is sponsored by the U. S. Bureau of Mines, producing companies, and union organizations. J. J. Forbes, chief of the Bureau's Health and Safety Division, is national chairman.

Are Your Eyes As Good As You Think?

THE importance of eye examinations after the age of 35 was stressed at the annual conference of the National Society for the Prevention of Blindness by Reginald E. Gillmor, vice-president of the Sperry Corporation.

Mr. Gillmor cited these figures:

1. In a sample survey of 300 workers over the age of 38 brought into the Sperry eye clinic for a checkup, 68 never had had their eyes examined. Of these 68, three-fourths needed glasses.

2. Of the remaining 232, added Mr. Gillmor, two-thirds needed glasses or a change of glasses.

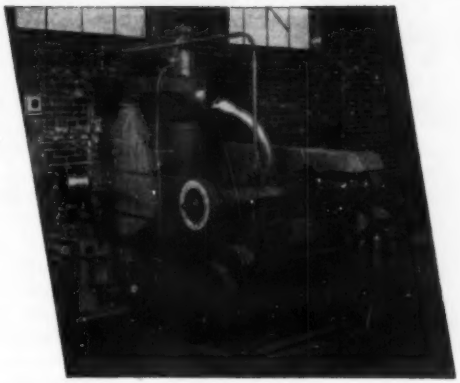
These figures, he said, point up the fact that people just won't seek eye care until their eyes begin to trouble them seriously.

Describing the vision program at Sperry, Mr. Gillmor told how a group of girls at Sperry were working on a job calibrating instruments. Their performance, for the most part was sub-standard.

It was found, he told the conference, that many of these girls had poor near-vision acuity. They were transferred to other jobs, and replaced by girls who could see very well at near distances. The standard of the work increased immediately.

Mr. Gillmor revealed that during the last war, Sperry's payroll jumped from 2,000 employees to 32,000 in a very short period of time. To test the visual skills of these employees, and then to place them at jobs where their visual skills could be best used, an eye clinic was set up.

Besides correcting visual defects with glasses, he said the optometrists at the clinic have also found early cases of cataract, glaucoma and other eye diseases, and referred these people to ophthalmologists for treatment.



Belting Dust for a Quick Knockout with a TORIT DUST SEPARATOR

In the illustration above, the hood and connecting pipe for the left hand abrasive belt have been removed. This has been done to show how this TORIT No. 19-FB Dust Separator fits into otherwise idle space.

TORIT

Torit Dust Collectors are available in both cabinet and cyclone types. They range in size from ½ to 5 H.P. and up to 2,100 cubic feet of air per minute.

Torit dust collecting equipment represents a compact, highly efficient design. It can be tucked into odd corners where it will not interfere with operations or cut off light. An installation like the one above handles large volumes of dust. Working conditions are improved and cleaned air is recirculated to minimize heat losses.

There are TORIT Dust Collectors for every standard dust creating machine, and special adaptations can be quickly fabricated. For details and latest TORIT catalog, write:

Torit Manufacturing Co.
304 Walnut Street St. Paul 2, Minnesota

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Maintenance Show

THE Plant Maintenance Show, newest of the giant industrial expositions, will next be held at Convention Hall, Philadelphia, Jan. 14–17, 1952, it was announced by Clapp & Poliak, Inc., New York, the exposition management.

The exposition, held for the first two years in Cleveland, has been moved to Philadelphia to permit greater attendance from the eastern industrial area. The second show attracted visitors from 39 states and more than 10 foreign countries.

The displays are expected to cover an area almost four times that of the first show, held in 1950. More than 200 companies are expected to participate. One hundred and fifty-six firms already have contracted for exhibit areas.

Concurrently with the show, the Plant Maintenance Conference also will be held. L. C. Morrow, consulting editor, "Factory Management and Maintenance," will serve as chairman. The last conference drew audiences of 1,700 at a single session and is one of the best attended annual technical conferences in the country.

"Production machines, and the plants which house them, will receive their most severe test in the coming year," said Saul Poliak, vice-president of the management firm. "Maintenance may well become the major problem of industry as it strains to fulfill defense needs and consumer demand. Shortages of both manpower and machines already are acute in many fields and they may become critical soon. The show and conference are planned to provide visitors with an opportunity to see the newest machines and to hear outstanding experts."

Advance registration cards and hotel information may be obtained from Clapp & Poliak, Inc., 341 Madison Ave., New York, N. Y.

Sellstrom Offers Glamour Shell-Rim Industrial Glasses With Steel Spring Embedded in Temples

The extraordinary feature of the new Sellstrom glamour glasses is a ¼" wide steel spring embedded in the entire length of the plastic temples. This makes them unusually pliable, but also keeps them firmly in place. The temples are ribbed at the ends and have optical hinges. The lenses are larger than the average and give greater protection to the eyes. Each pair comes in an attractive case.

The men's size has 49 m/m Drop Oval Lenses, while the women's size has 44 m/m Drop Oval Lenses.

Order a few sample pairs direct for "on the job" testing and we will then also give you the name of a near-by dealer who can supply you. Prices quoted are for less than dozen lots.

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Water Fog

(From page 22) in a ratio of one part to 99 parts of water or 2 parts to 98 parts of water.

There are several methods of proportioning wet water such as an in-the-line eductor, an around-the-pump-proportioner, a diaphragm type proportioner, etc. All of these devices accomplish their purpose, and they all have certain advantages and limitations.

It has been pointed out before that water in the form of fog or spray is the best method of applying water to any fire. For any class "A" fire where it is necessary or desirable to conserve water, it is definitely advisable to use a wetting agent.

Conclusion

Water fog or spray is an essential factor in modern fire protection. The trend in all types of fixed and portable fire fighting equipment has been to develop equipment that will utilize the inherent superior cooling power of the fog.

Another step to produce better fire protection has been to inject wetting agents into the water feeding the fog nozzles. This, as we have already seen, produces a superior class "A" extinguishing agent. Along this same line, but not previously mentioned, mechanical foam liquid is now being injected into the water feeding modified fog nozzles. This produces what is known as fog-foam which is a superior extinguishing agent for gasoline and other highly volatile flammable liquids.

It is the opinion of the writer that fog will play an ever increasing role in the field of fire protection, reducing property losses and safeguarding human lives.

Pictures by courtesy of Rockwood Sprinkler Co.

Bil-Jax Expands

THE latest step in a long-range expansion program by Bil-Jax, Inc., Archbold, Ohio, manufacturer of tubular steel scaffolding, was taken recently with completion of a large addition to its plant. The 58 x 65 foot addition is modern in every respect, and greatly expands the firm's capacity, affording much needed extra space for the fabricating, painting and shipping departments. The Bil-Jax line-up of products not only includes tower type scaffolding, but also rolling work platforms, maintenance trestles, sectional and lean-to ladders of tubular steel, ladder jacks, leveling jacks, scaffold brackets, hoist arms and many other items.

The firm also introduced a house organ, "Bil-Jax Scaffolding News," carrying news and illustrations not only of Bil-Jax products and activities, but of the construction industry. Names of interested contractors wil be placed on the mailing list to receive future issues. Address requests to: Bil-Jax, Inc., Archbold, Ohio.

New Products—Page 72

Skin Cleansers

(From page 26) type cleanser. The vicious circle in reverse! Testing a new skin cleanser should be over a 30 day period, not just a few hand washes.

Selecting the Cleanser

In the selection of an industrial skin cleanser, as in the selection of most complex chemical formulas, the integrity and the ability of the vendor should be given prime consideration. As a purchaser, one certainly is entitled to know the amount of research which has gone into the formulation of the product and the reputation of the medical advisers who have checked the product which one is expected to purchase. Experience has shown that relatively few physicians have broad knowledge in either the composition of industrial cleansers or the importance of a detailed knowledge of all the component parts used in their formulation. Like most of us, the general attitude has been "soap is soap."

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Proper Use

No matter how careful your vendor may be in the formulation of the product for your industrial employees, no benefit can be derived therefrom if you have not properly educated the employee to use, at frequent intervals, the cleansing materials which are offered for his benefit. A good skin cleanser in a dispenser is of no assistance. It must be *used* by the employee. Proper personal cleanliness habits can pay big returns in the reduction of lost time, dermatitis and just plain sore hands that cannot produce as well as healthy hands.

You may say, "We have no skin irritants in our plant." A complete review might well be in order. We believe you will find that your maintenance men remove paint from their hands with paint thinners, one of the worst irritants. A survey will probably surprise you at the number of places where employees have used their own ingenuity (but not common sense) to avoid that trip to the washroom at quitting time.

In summary, a powdered industrial skin cleanser is a complex formulation of as many as fifteen different ingredients, each added to the formulation for a specific purpose. It can serve you best when combined with an educational program that will insure its use by the employee. It should be a product that will take full advantage of both chemical and mechanical action, so as to remove deeply embedded soils and irritants without impairment of the skin. For the average industrial plant it is easier to check the integrity and ability of the vendor than it is to conduct the detailed, research program necessary to keep abreast of the fast changing detergency picture. It is recommended that a committee composed of your industrial physician, safety engineer, plant engineering department and your purchasing department, be selected to visit your vendor's plant. They should inspect manufacturing facilities and be assured that the laboratory which controls both production and experimental work is well staffed with competent personnel. If he is the right kind of vendor, you will be supplied with the right kind of skin cleanser. If he is assuming that "soap is soap" you may pay the cost through lost time, compensation cases and a personnel problem based on the premise that you either don't know or don't care about his personal problems.

The stepped up defense program will call thousands of new workers into industrial jobs and past experience has taught us that dermatitis will increase as a result of these newcomers. Your best protection will be the advice and counsel of an expert in the specialty field of proper skin cleansing, but be sure

he is a specialist by checking all phases of the organization he represents. When you have the right vendor you'll have the right product—then be sure your employee has the right personal cleanliness habit. This combination will give you healthy hands—industry's most important tools.

Picture by courtesy of Bradley Washfountain Co.

Elevator Industry To Cut Accidents

ACTING to combat increasing shortages of industrial manpower, the nation's elevator manufacturers have inaugurated an accident prevention program designed to reach ultimately into every department of every plant in the elevator industry.

A safety committee appointed by Commissioner John McArdle of the National Elevator Manufacturing Industry, Inc., of 101 Park Avenue, New York, will distribute technical and educational bulletins throughout the industry, exchange ideas on improved safety practices, and compile and distribute accident statistics.

"The U. S. Dept. of Labor," said Commissioner McArdle, "reports 37.7 disabling injuries per million man-hours in the field of installation or erection of building equipment. Although this is below the median for the construction industries, it is certainly susceptible of improvement. If we can reduce it substantially, we shall have lessened human suffering, contributed to industrial productivity, reduced building costs and made our member companies better members of the American industrial family."

W. J. Niederauer, safety director of Otis Elevator Co., was appointed chairman. He will be assisted by H. S. Ritter of Westinghouse Electric Corp., Robert R. Fisher of Watson Elevator Co., John P. Manning of Haughton Elevator Co. and C. P. Donaldson of J. W. Kiesling & Son.

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Exhaust Systems

(From page 50) on the dust collector or air cleaner. It must be remembered, above all else, that the final criteria shall be the actual concentration of the contaminant in the air surrounding a workman and/or in the discharged air from the cleaner or collector.

In the foregoing, we have recommended certain inspections and tests other than the visual inspection to determine the condition and efficiencies of the exhaust system.

There are several methods of air volume determination or flow measurement. The most accurate and convenient method to use, in most cases, is the Pitot Tube method which we recommend highly. Other methods are by use of the: Deflecting vane or Rotating Anemometer; Velometer; Various thermocouple, thermometer and hot wire Anemometers.

Air sampling methods are many and also somewhat diverse, each having its own advantages. For determination of concentrations of air contaminants without entering into a discussion of relative merits of methods, we recommend the impinger method. This recommendation is made because the U. S. Public Health Dept. and Bureau of Mines have used this method extensively and any determinations made can be compared against that standard. For determinations of weights of dust, we recommend the filter thimble method.

Other methods of determining quantities and concentrations of air contaminants are: Settling in Sampling Tube, Electrostatic Precipitation, Air Washer, Thermal Precipitation.

The efficiency of the dust collector can be determined by sampling the effluent air and measuring the hopper discharge. The quantity of dust passing the filter, as determined by the sampling test compared with the quantity of dust actually captured, indicates the efficiency by weight of the unit. This is usually the way a collector unit is rated by the manufacturer.

In closing let us consider the organization for maintenance. Here again the plant size, present maintenance program, exhaust systems application and many other factors have a bearing on the final decision; however, since the maintenance must be carried on according to schedule and includes certain test work to determine the system's condition and present operating level, the maintenance and maintenance inspection should be the responsibility of a single person who can evaluate the information procured in the regular schedule of inspection. He, of course, is responsible to the Maintenance Superintendent or equivalent and procures his manpower from the maintenance personnel.

Pictures by courtesy of American Wheelabrator & Equipment Corp.

From an address presented at the 27th Annual Midwest Safety Conference.

Accident Rates Down

AMERICAN workers were a lot safer in 1950, the National Safety Council reports. Industrial injury rates for last year, released by the Council in the 1951 edition of its annual statistical yearbook, "Accident Facts," show a substantial reduction in both the frequency and severity of 1950 accidents as compared with 1949.

Twenty-nine of the 40 basic industry classifications reduced their frequency rates, and 23 reduced severity rates.

Frequency Rate

The accident frequency rate for employees in all industries submitting company reports to the Council, based on the number of disabling injuries per 1,000,000 man-hours, was 9.3 in 1950—a reduction of 8 per cent from the year before.

The communications industry again led all other industries by turning in the lowest employee frequency rate. Its rate was 2.05—a 4 per cent reduction from 1949. Aircraft manufacturing again ranked second with 4.17, followed by the electrical equipment industry with 4.28 and steel with 4.63.

Lumbering stayed at the bottom of the frequency list in 1950 with a 46.85 rate, but this represented a 2 per cent reduction. The frequency of coal mining accidents went up 5 per cent, and that industry remained in the next to last position with a 43.64 rate. Mining other than coal was third from the bottom, just below clay products.

Severity Rate

The accident severity rate for all industries reporting to the Council, based on the number of days lost per 1,000 man-hours, was .94 last year—a reduction of 8 per cent from 1949.

Communications also had the lowest severity rate, leading all other industries with a rate of .12 —a 20 per cent drop from 1949. The service industry came up from fourth place in 1949 to second in 1950 with a substantial 37 per cent reduction to give it a rate of .19. The tobacco industry stayed in third place with no change in its rate of .23, just ahead of printing and publishing.

In terms of severity, coal mining once more stayed at the bottom of the list, with the highest accident severity rate of 7.91—a 16 per cent increase. Lumbering was next to last with 4.79. Mining other than coal continued to improve its rate with a 30 per cent reduction to 3.25.

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Safety Engineering

(From page 15) necessarily mean a whirlwind salesman; we don't mean long-winded dissertations or brass bands blaring. This may work too, but the quiet, unassuming fellow, the almost bashful fellow, can also sell. Anyone can sell safety. It may take one fellow a thousand words to say "It's sensible"; the bashful fellow may say it in two words.

To sell safety we have two outstanding sales points. One is the cash dollar-and-cents savings on production, insurance, etc.; the second is the humane aspects, the saving of life and limb. The humane aspect makes safety the most important product for sale in the world today. A commercial product is always tested for public acceptance before being put into mass production. We do not need that test for safety. We know safety and safety engineering has public acceptance. By using the humane aspects of safety, plus dollar-and-cents savings, we can sell safety on a common sense basis. We must, in order to do this, use *salesmanship*. If you don't have it, develop it; if you have it, use it.

Everyone is a potential salesman. Combine *ingenuity, patience* and *perseverance* and incorporate them into your selling campaign.

E. C. A. Safety Team Visits U. S.

Safety, labor and management officials from Sweden, Norway, Denmark and Turkey study recent developments in equipment to protect industrial workers at the Mine Safety Appliances Company, Pittsburgh. The group of 12 representatives was the first industrial safety team to be brought to this country by the U. S. Department of Labor and the Economic Cooperation Administration. About 10 other teams are expected to participate. In this photo, W. R. Sweeney (left) of MSA's International Division, is demonstrating an automatic artificial respiration instrument to (left to right) Lars Andre, Swedish Workers Protection Board; A. J. Neilsen, Danish Federation of Trade Unions; Magnus Pelow, director general of the Swedish Workers Protection Board; Akret Altinel, research engineer of Turkish Mechanical and Chemical Industries; Birger Kristofferson, safety director of the Norwegian Water Power Co.; and Tor Arnevag, superintendent of the National Safety Council of Norway.

SAFETY education, although not recognized as such, exists in the teaching of virtually every technical course, Dr. Walter Cutter, assistant director of the New York University Center for Safety Education, told members of the first E.C.A. Industrial Safety Team during their visit to N.Y.U. recently.

The 10 Scandinavians and two Turks who compose the first E.C.A. team described safety education in their respective countries as varying from non-existent to limited to no more than 10 hours. Although proposals are now under consideration in each of the countries to increase the emphasis on industrial safety, a lack of funds for the projects was cited as the chief prohibitive factor.

Dr. Cutter also told the group: "Safety should be regarded as a normal part of technical education, not as something which is added to the curriculum. Whatever validity safety has lies in its intrinsic value. Safety education is merely an awakening to a situation which already exists."

Good safety practices are taught in technical courses under the guise of "operating procedures," the N.Y.U. assistant professor of industrial safety stated.

With reference to the expenses involved in safety education, Dr. Cutter emphasized, "The safety man who cannot save his company many times more than his salary is indeed a very poor operator."

At the morning session, Dean Paul A. McGhee of the Division of General Education welcomed the group on behalf of the University. Dean McGhee briefly traced the history of the N.Y.U. Center for Safety Education for the group which is making a two-month tour of the United States to study industrial safety by visits to plants, administrative agencies, schools and associations.

Robert J. Broderick, of the Bureau of Labor Standards, is accompanying the group whose tour is under the auspices of the Economic Cooperation Administration and the U.S. Department of Labor.

During the N.Y.U. visit, the team studied the curricula of the Safety Center and recent trends in safety education through an open discussion.

Highlighting the afternoon session were group discussions under the direction of prominent safety engineers from throughout the metropolitan area, an inspection of driver testing equipment of the Center for Safety Education, and a demonstration of safe driving tests similar to those administered to "accident repeaters" in New York and Connecticut.

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Maintenance Problem

(From page 37) *of the need to maintain production.* In a process where a shutdown is disastrous, the maintenance group will be separate from the production group who are mainly concerned to keep up quality. In a job shop, the superintendent will have much to say on the maintenance problem and its personnel.

2. *The relative cost of maintenance.* If it is high, that of itself will place it under a major maintenance executive with much to say on how production shall run—the paper mill. If it is a relatively low cost, it may never get above a handyman in the production group—the brick yard.

3. *The relative complexity of the maintenance job itself.* If the tools of production are unique, the maintenance personnel will be studded with specialists—the meat packing plant. If the tools of production are more or less all-purpose, the maintenance personnel will be general all-round mechanics—the sheet metal plant.

To be continued in the October issue.

From an address presented at the Second Plant Maintenance Show, Cleveland, Ohio.

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Heat Insulation Aids Plant Safety

WHILE the heat escaping from an uninsulated steam line or exhaust flue may or may not have any economic value, it can start a fire costing thousands of dollars. Also, employees working in the vicinity of exposed hot surfaces are in constant danger of being burned by brushing against a hot line or a hot flue. To avoid this fire and safety hazard, warns The Magnesia Insulation Manufacturers Association, hot lines and equipment should be insulated regardles of economic considerations.

According to A. S. Hall, Engineering Division, Factory Mutual Laboratories, any surface at a temperature above 700 F will quickly ignite most combustible materials which come in contact with it. Prolonged exposure to considerably lower temperatures may cause gradual charring and eventual ignition of wood, textile fibers and paper. Even the moderate temperatures produced by low pressure steam pipes occasionally cause fires by promoting spontaneous ignition in oily waste, paint-soaked clothing or other materials with spontaneous heating tendencies.

An uninsulated metal exhaust stack from an oil-fired furnace, located in the storage room of a paper board plant ignited roll paper accidentally piled against it and the resultant fire caused damage exceeding $100,000. In another instance, a bare pipe carrying 12 lb. steam passed through a rayon waste storage bin. The pipe caused charring and eventual ignition of the waste in contact with it and the fire spread to nearby bins. Estimated damage, $9,000.

Some state industrial safety codes require heated surfaces to be insulated, for the protection of plant workers. The General Industry Safety Orders issued by the State of California Department of Industrial Relations states that ". . . exposed metallic surfaces having an external surface temperature sufficient to burn animal tissue . . . where subject to contact within 7 feet . . . from the floor . . . or within 15 inches . . . from stairways, ramps or fixed ladders shall be covered with thermal insulating material. . . ."

In numerous situations, workroom temperatures are increased by heat radiated from uninsulated surfaces to a level causing acute worker discomfort or even to the point of health hazard. Studies have pointed up lowered efficiency and increased accident rates under such conditions.

Fire Hazards of Mercantile Buildings

THE important things to look for in connection with fire hazards frequently found in mercantile buildings are briefly outlined in a special bulletin of the National Board of Fire Underwriters.

Accumulations of waste materials present an easily recognized fire hazard. In addition to checking up on ordinary rubbish conditions, the kind and location of receptacles for ashes, and the method of storing and handling waste paper, rags, empty packing cases and excelsior should be investigated. Rags containing paint or vegetable oils are especially hazardous because of the danger of spontaneous heating and ignition.

Chimneys should be examined for defects which might cause fires, the more obvious of which are cracks in the chimney, and stovepipe openings which are not properly closed. These may allow hot gases to escape into the building and thus cause the ignition of combustible materials. Other important items bearing on the fire hazard are the construction of the chimney, its height above the roof, and the clearance of wood beams, joists and lathing from the chimney. These should be checked up as far as practicable. They should properly be looked after while the chimney is being built.

The principal source of fire hazard in connection with heating equipments comes from insufficient clearance from combustible materials. Heating appliances, smoke pipes, gas appliance vents, range hoods, warm air ducts and registers, and steam and hot water pipes should all be examined for their clearances from combustible materials. The mounting of heating appliances and the construction and protection of warm air ducts and range hoods should also be checked.

Electric & Gas Hazards

Electric wiring and equipment should be examined for the more prominent defects which may cause fires, such as wiring that is insecurely supported or unduly subject to injury, loose or broken fixtures, wires with damaged insulation, fuses bridged or too large for the circuit they protect, outlet, fuse or switch box covers open or missing, improper use of flexible cord, and highly flammable materials in contact with light bulbs. If a large number of defects is found or the wiring appears to be in a hazardous condition, the situation should be called to the attention of the local authority governing electrical installations.

With regard to gas piping and equipment the principal things to look for are: Conditions which may allow gas leaks; clearances of gas appliances from combustible material; and proper venting of gas appliances to the outer air. Flexible gas tubing is a common source of gas leaks; the necessity for its use, the quality of tubing, the type of connections, and the location of valves are the important features to be checked.

Flammable Liquids

The storage and handling of flammable liquids should be carefully investigated. The more commonly found ones are gasoline, kerosene, alcohol, ether, turpentine, benzine, linseed oil and fuel oil. The principal features in regard to their safe handling and storage are the type and construction of storage containers, the quantities stored in the building, methods and devices used for drawing the liquids from the containers, and proximity of open flames or other sources of ignition.

Among the many other substances of special hazard which may be found in mercantile buildings are the following: Matches; explosives, fireworks; small arms ammunition; nitrocellulose photographic, or motion picture film; pyroxylin plastic materials (called by such names as celluloid, parylin, viscoloid and others); calcium carbide; nitrates, nitrites, chlorates and other oxidizing materials; nitric, sulphuric, hydrochloric and other strong acids; and compressed gases such as oxygen, acetylene, hydrogen, chlorine, bottled gas (butane and propane) and others.

Mechanical refrigerating machines are a source of hazard where the refrigerant employed is a flammable, irritant or toxic gas. The principal features to be looked into are the possibility of leakage from mechanical injury of piping or tubing and the possibility of and provisions for relieving excessive pressures.

The inspections should be made to determine whether all fire hazards are properly safeguarded, also to acquaint the members of the fire department with the hazards which exist in the buildings, where they may at any time be called to fight a fire. The fire department should know the locations where flammable liquids or hazardous chemicals are kept and approximately how much. They should know the location of the main gas shut-off valve and the electric service switch. They should also know what gas the refrigerating system contains and what to do in case the gas becomes released.

Details of the necessary provisions for safeguarding the hazards enumerated above are contained in the following publications of the National Board of Fire Underwriters:

Building Code Standards for the Installation of Heat Producing Appliances, etc.

National Electrical Code.

Standard for the Installation of Gas Piping and Gas Appliances in Buildings.

Suggested Fire Prevention Ordinance.

Safety Show Preview

VISITORS to the National Safety Show will have a chance to see in action a new dispenser for the prevention of athlete's foot when they stop in at Booth #121 of Sani-Mist, Inc. The company is putting on display a new treadle-type dispenser. The mechanism is filled

with an antiseptic solution known as Sani-Mist which contains the latest accepted U.S.P. ingredients for the control of athlete's foot fungi. The treadle motion of the dispenser, as the person "marks time," activates hydraulic pumps which spray a fine vapor through the aluminum grill opening on which the person treads. The mist covers the feet and ankles and penetrates between the toes. A treatment takes only 3 seconds, and the method assures each individual a fresh and undiluted treatment.

All visitors to the show are cordially invited to Booth #121, and see how this modern preventive method works. And someone who visits the booth will walk away with a dispenser, since the company plans to hold a drawing from available registration.

Chain Recommendations

THE proposed Simplified Practice Recommendation for Weldless Chain and Chain Products has been approved, and became effective September 1, 1951, the Commodity Standards Division of the Office of Industry and Commerce, U. S. Department of Commerce, reported. It is identified as R245-51.

The recommendation, proposed by the Chain Institute, Inc., consists of a simplified list of kinds and sizes of weldless chain and chain products that currently are in general use and demand, and are regarded as affording an adequate selection for ordinary use and for stock. It shows, in addition to sizes, the recommended finishes for the 26 items of chain and chain products covered by the recommendation.

Until printed copies are issued, mimeographed copies of Simplified Practice Recommendation R245-51 may be obtained from the Commodity Standards Division, Office of Industry and Commerce, Washington 25, D. C.

Free Bulletins
See page 75

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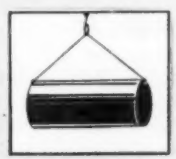
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The Future Shows

York Harbor, Me.

September 6–7. Twenty-fourth Annual Maine State Safety Conference & Exhibit. (Marshall House). Arthur F. Minchin, secretary, Maine Safety Conference, Dept. of Labor & Industry, State House, Augusta, Me.

Newark, N. J.

September 11–12. Modern Sanitation and Safety Show. (Essex House).

Cleveland, Ohio

September 18–20. Ohio State Safety Conference (Hotel Carter). Carl L. Smith, executive vice-president, Ohio State Safety Council, 2073 E. 9th St., Cleveland 15, Ohio.

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Houston, Texas

September 27–29. Fourth Annual Gulf Coast Regional Conference on Industrial Health (Rice Hotel). David M. Wood, conference chairman, Houston Chamber of Commerce, P. O. Box 2371, Houston 1, Texas.

Chicago, Ill.

October 8–12. Thirty-ninth Annual National Safety Congress and Exposition. (Congress and Stevens Hotels). R. L. Forney, gen. sec., National Safety Council, 425 N. Michigan Ave., Chicago, Ill.

San Francisco, Calif.

October 29–November 2. Seventy-ninth Annual Meeting American Public Health Association. (Civic Auditorium) Dr. R. M. Atwater, executive secretary, American Public Health Assoc., 1790 Broadway, New York 19, N. Y.

Lafayette, Ind.

November 18–20. Sixth Annual Industrial Recreation Conference, Technical Extension Division, Purdue University, Lafayette, Ind.

Baton Rouge, La.

December 3–4. Annual Louisiana Safety Association Conference. (Louisiana State University) Charles E. Doerler, secretary, P. O. Box 806, Shreveport, La.

New York, N. Y.

April 1–4. Twenty-Second Annual Greater New York Safety Convention & Exposition. (Hotels Statler and New Yorker). Walter A. Gustafson, general chairman, Greater New York Safety Council, Inc., 60 E. 42nd St., New York 17, N. Y.

Chemical Safety Award Announced

ESTABLISHMENT of the Lammot du Pont Safety Awards to be presented annually by the Manufacturing Chemists' Association to two member companies showing the greatest improvement in plant safety over the preceding five years was announced recently by Charles S. Munson, chairman of the Association. Initial presentation of the Awards will be made at the Association's annual meeting in June 1952.

Consisting of inscribed bronze plaques, the Awards are financed by a cash gift to MCA from Lammot du Pont, former chairman of the board of E. I. du Pont de Nemours & Company and a former chairman of the Association. In presenting the gift Mr. du Pont stipulated that it be used "for the purpose of increasing the interest in industrial accident prevention and improving the safety records of member companies."

Competition for the new awards will be keen, Mr. Munson believes. "The chemical industry already has an outstanding safety record," he said, "and it is hoped that the awards will stimulate even further improvement."

The Lammot du Pont Awards will be made annually to two MCA member companies, one having less than 2,000,000 man-hours exposure a year and to one company having over 2,000,000 man-hours exposure. Selection of the winners will be on the basis of the greatest percentage reduction in average accident frequency rate for the preceding two-year period in comparison with the average frequency rate for the three-year period immediately before that.

Underwater Light

VIRTUALLY any portable light can be operated successfully under water in the event of an emergency, such as a drowning, or the loss of a valuable ring. This

information for persons who go bathing, boating, and fishing was recently given by Gwilym F. Prideaux, miniature lamp specialist for General Electric's Lamp Department. Failure to realize this fact often means the loss of precious time in the search for the body of a drowning person, he said.

If the water is reasonably clear, according to Prideaux, it is possible for a diver to see a "considerable distance" with the aid of a five-cell flashlight. In the event the water is muddy, however, even the most powerful diving lamps, such as one of 1000-watts, will throw a beam only a few feet.

"In general, I would say that almost any of the battery-operated, portable searchlights normally carried by policemen, firemen, and utility troubleshooters would be quite satisfactory to take under water for emergency use," the G-E engineer declared.

Prideaux cautioned that for best results the cover glass of the searchlight should be broken, and the bulb should not be lighted until submerged. Otherwise, the hot bulb would break upon contact with the water, he said. He also warned that breaking the lens of a lamp of the all-glass, sealed-beam type would make the lamp inoperative under all circumstances.

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Windowless Buildings

MANY buildings in recent years have been built with blank exterior walls in place of the usual walls with windows, and many older buildings have had their window openings filled with glass block or masonry or have had new false fronts put on the buildings so as to cover up the windows.

Such windowless walls, particularly in multistoried buildings, may introduce hazards to the lives of the occupants as well as presenting new and added difficulties or dangers to firemen in fighting a fire, according to a bulletin of the National Board of Fire Underwriters.

Windows are not regular means of exit but nevertheless windows frequently have provided means whereby persons in time of fire have been able to make their escape, or to give notice of their need of rescue, or to give an alarm of fire.

Windows also are frequently useful in providing a means for release of smoke and gases from a fire in the building, as ordinary windows are broken readily to accomplish this purpose. They may be broken by the heat of the fire or by a smoke explosion or back draft or may be broken readily by the firemen.

Artificial lighting in a building frequently becomes extinguished during a fire and where the building is windowless this may plunge the interior into total darkness, thus creating a night-time condition in the middle of the day.

Each of the above mentioned situations exists to some extent or at some times in buildings with the usual window openings, because windows are not always openable, wired glass, which is used in many windows is not easy to break and some windows may have tin clad or sheet metal shutters; also at night windows would let in little light even if provided. Furthermore, many buildings in the business areas of cities have some blank masonry wall areas which in some cases are very large, and for certain occupancies as storage warehouses, grain elevators, and breweries essentially windowless buildings have been common for many years. And it should not be overlooked that for some conditions windowless walls have strong advantages, as there is nothing in the way of window protection or fire fighting equipment, private or public, that can be as effective in stopping the spread of fire among closely grouped building as a good substantial, fire resisting wall without openings. However, none of these situations presents quite the same hazard to occupants and firemen as a windowless mercantile *(To page 76)*

industrial Hygiene

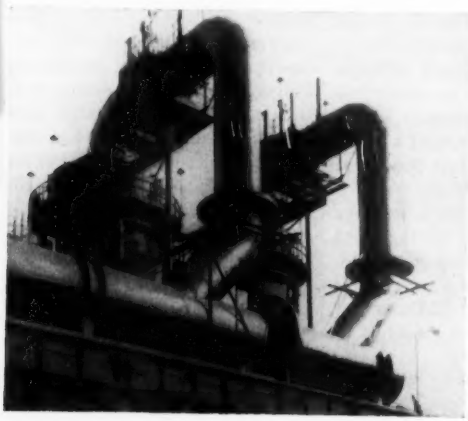
ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

SMOKELESS SMOKE STACKS

SMOKELESS stacks on the new boiler plant of National Tube Company's National Works, McKeesport, Pennsylvania, are not a sign of slack business but of the co-operation of industry with the smoke control program of this busy steelmaking center. Designed to produce an absolute minimum of fume and solids in waste gases, the new boilers are fired with gas from this U. S. Steel plant's four blast furnaces, with pulverized coal as an auxiliary fuel.

An average of 17,400,000 cubic feet of gas an hour is produced by the four blast furnaces. Of this amount, approximately 69 per cent, or 12,000,000 cubic feet is available for use in the new boiler house.

Gas cleaning is accomplished in two modern gas washers and two electrostatic precipitators. A main 9 feet in diameter conducts the gas from the furnaces to the washers. Based on a capacity of 230,000 cubic feet of gas a minute, the washers reduce the dust content to 0.25 grains a cubic foot by passing the gas through multiple fine sprays of water.



A major step toward smoke control is shown above in the installation of two modern gas washers and a companion set-up of electrostatic precipitators for cleaning gas from the furnaces, in the high-pressure boiler plant of U. S. Steel's National Tube Co.

From the washers the gas passes to two double-compartment precipitators. Here it flows through a high-tension electrical field, becoming part of the electrical circuit, with the result that the solids are precipitated through the action of electrostatic charges. The precipitators reduce the dust content of the gas to 0.01 grains a cubic foot.

The dust in the precipitators is washed away constantly and flows by gravity to a 90-foot diameter multiple-trough thickener. The sludge effluent from the wet washers is pumped to this same thickener.

The settled solids from the thickener are pumped directly to a drum-type vacuum filter which can produce 172 tons of filter cake in 24 hours. This cake, with a moisture content of 25 per cent, is scraped from the drum and dropped directly into cars for removal to the ore stock pile for recovery by sintering.

Coal for the new unit is handled in the conventional manner. First lifted from barges by a coal tower, it passes through a crusher to a storage hopper, then is fed by means of rotary-vane feeders to a belt conveyor for discharge into a bucket elevator.

From the elevator the coal discharges to a belt conveyor equipped with a tripper and mounted over the boiler house coal bunkers. Removal of tramp iron is accomplished by two magnetic pulleys on the conveyors.

From the boiler house bunkers, the coal passes down through spouts to automatic scales, thence to the feeders and on to the pulverizers. Each boiler is equipped with its own scale, feeder, and pulverizer.

Coal-Fire Control

Gases and fly ash emanating from coal are controlled by dust collectors designed to meet the requirements of

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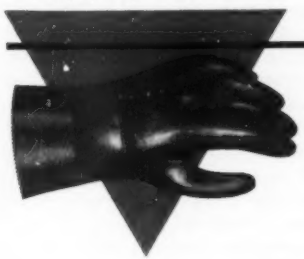

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the new Allegheny County (Pittsburgh and environs) Smoke Control Ordinance. The ash-handling system is of the conventional vacuum type with a capacity of 20 tons an hour. It collects from ash hoppers, boiler soot hoppers, dust collector hoppers, and stack hoppers, and delivers into a 100-ton capacity silo through a cyclone and air washer. Ashes from the silo are discharged into either trucks or cars by a dustless unloader.

There are five, two-drum boilers with fully water-cooled furnaces in the new unit. Because of availability and past satisfactory performance, tangentially fired units were selected. Coke oven gas pilot burners are installed in each unit. Superheat temperature from each boiler is controlled by an automatically operated atomizing, spray-type desuperheater in each boiler steam discharge outlet. There are no surface condensers available to provide pure water for this purpose, so the condensate from the high and low-pressure heaters is used.

To minimize maintenance and operational problems, all driven units possible are located on the ground floor. All feed water heaters and pumps are concentrated in one bay at the east end of the boiler house.

Most auxiliary units having high power requirements are steam turbine driven with electrically driven standby units for flexibility of operation and protection against failure. Pressure for driving the auxiliary turbines were determined from heat balance studies.

Pulverizer drives are an exception, for it was felt that steam requirements from coal are so low (approximately 10 per cent of the total) that only a drastic failure of all five units could affect plant operation. As a result, all pulverizers, feeders, and scales are motor driven.

With the exception of the coal-handling system, from coal tower to pulverizers, all units are broken up into duplicate sizes and are so cross-connected that only a major failure can seriously affect plant production. Pumps are also installed in duplicate sizes of partial plant capacity, with an extra unit as emergency standby.

Clean water for the boilers presented a problem, as no condensate return can be anticipated in the immediate future, leaving raw river water as the only available source. To solve the problem, it was decided to make use of seven existing settling basins and to hasten the settling process by the use of coagulants.

The new water softening plant is of conventional design except for size as related to steam output. Because of varying qualities of the make-up water and consequent varying blowdown from the boilers, it was necessary to design the water-softening plant

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larger than is customary.

The treating plant is of the lime-soda, hot-process type, effecting silica and hardness reduction in reaction tanks, followed by filtering and stabilization before delivery to de-aerating equipment.

Fourteen pressure type filters are installed immediately west of the water softening building. Three lime-soda mixing tanks and pumps, two sulphite mixing tanks and pumps, two phosphate mixing tanks and pumps, and one acid tank and pumps constitute the auxiliaries. Each boiler is furnished with its own phosphate feed pump, arranged for timed phosphate feed and automatic flushing of the lines, however.

All chemicals are handled from cars by means of skids and a storage-battery lift truck, up an elevator and down a ramp to the second floor of the water-softening plant. Bags of chemicals are opened on this second floor and the contents poured through a pipe to the proper mixing tanks. The mixing tanks are served by a separate ventilating system discharging into a small cyclone collector from which waste materials can be recovered.

Indicating and recording instruments and control stations throughout the plant keep the staff thoroughly informed and in control of operating conditions at all times, while up-to-date safety factors and building services make the new smokeless, high-pressure boiler plant a safe and comfortable place for employees.

Treatment of Eye Injuries

THE use of ACTH, Cortisone, and the antibiotic drugs have made a "tremendous improvement during the past ten years" in the treatment of eye wounds among industrial workers, said Dr. Edmund B. Spaeth, of Philadelphia, at the annual conference of the National Society for the Prevention of Blindness held in New York.

Dr. Spaeth pointed out that ACTH and Cortisone have been shown to be effective in treating sympathetic ophthalmia—loss of vision in one eye that sometimes occurs following serious injury to the other eye.

He added that the antibiotics—streptomycin, terramycin, etc.—now make the danger of secondary infection following an eye injury almost inconsequential.

Discussing eye injuries from a metallic substance in the eye, Dr. Spaeth described the use of small and large magnets to draw the metal object from the eye. He said that the surgeon, before using the magnet, must determine whether the substance is magnetic, and its general location in the eye.

Dr. Spaeth revealed that in a survey made in Philadelphia of accidents which resulted in the loss of 50 eyes, it was found that 27 were lost needlessly.

A good industrial vision program, he concluded, should include these three points:

1. Visual analysis of all workers.
2. Job placement according to visual skills.
3. Treatment, rehabilitation and replacement of workers who suffer eye injuries.

Methyl Chloride Data Sheet

INFORMATION on the safe handling and use of methyl chloride is contained in a new publication, Safety Data Sheet SD-40, issued by the Manufacturing Chemists' Association, Inc.

As a chemical reagent or solvent, methyl chloride possesses certain properties which may present hazards in its handling: It is subject to slow decomposition upon contact with moisture. At high temperatures it may break down into compounds which are toxic. And it is flammable. Bulletin SD-40 sets forth safety rules and precautions to avoid all of these hazards.

The manual also includes I.C.C. regulations which apply to tank cars and cylinders used in transportation of the material. These cover loading, unloading and return of empty containers, as well as correct labeling. Effective employee education is stressed, and complete information of first aid and medical treatment is given for guidance in the control of health hazards likely to arise where methyl chloride vapors are present.

Chemical Safety Data Sheet SD-40, Methyl Chloride, (17 pages) may be purchased at 30 cents a copy

from the Manufacturing Chemists' Association, Inc., 246 Woodward Building, Washington 5, D. C. Remittance should accompany order.

Acrylic Fiber Filter Bags

THE smoke may go out the chimney, but there's a difference in dollars saved to many manufacturers operating modern plants where smokestack wastes are filtered through soot-collecting bags made of the new "Orlon" acrylic fiber.

Communities profit, too, where filtration bags are used to put an end to the air-contamination nuisance. But for the manufacturer, soot frequently is pay dirt.

Plant operators have experimented with collection bags for years, but until the development of Du Pont's tough "Orlon" with dimensional stability to heated gases and resistance to acids and acidic fumes, collection bags often failed with resultant loss to valued product and contamination of the atmosphere.

One firm ran its carbon black operation at a loss until experiments with the new fiber solved the problem of reclaiming costly wastes from its smokestacks. The trouble started when production began on a new type of carbon black which the firm supplied for rubber, paint, varnish, inks, plastics, and, strangely enough, for making sugar whiter.

At one plant, extremely fine particle sizes of black were being made. With the new product, the plant's recovery unit dropped 60 to 70 per cent in efficiency. Since this was a difficult product to make and yields were low, the firm ended up selling the black "in the red."

As a remedy, the firm, already experienced in the use of filters, tried a secondary system using the bag filtration method. Fabrics used earlier, however, had failed and the system had fallen into disuse until several fabrics of synthetic fibers were tested.

Advantages of "Orlon" are its good-to-excellent resistance to mineral acids, fair resistance to weak alkalies, and the fact that it is not harmed by common solvents, oils, greases, neutral and most acid salts. Added to these properties are its dimensional stability to heated gases and its resistance to acids and acidic fumes at high temperatures. Manufacturers also point out that bags made from fabrics of the acrylic fiber have to be changed less often than those of other materials. The longer life results in economies because less operating time is lost for changes, and labor costs of making more frequent changes are saved.

Successful use of dust collectors made of "Orlon" is also reported by a large producer of metals. In this installation, it is used in one of the firm's roasting processes. The wastes funneled through the bags of "Orlon" contain sulfur, zinc, lead, and cadmium. The presence of moisture often causes an acidic condition.

Here resistance of "Orlon" to chemicals helped to keep the bags on the job and to reduce the cost per-bag-per-operating-day nearly in half.

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LEARNING THE

SLICK FLOOR— SICK PATIENT

GOOD building maintenance is necessary to safety. A woman office employee was approaching her desk when her foot struck a slick place on the waxed floor. In falling, she hit a small table at the right side of her desk and received a scalp wound, as well as bruising her elbow and hip. Slippery floors can be eliminated. There are non-slip floor finishes available for all types of floors. However, they must be properly applied and correctly maintained to be effective. There is also the possibility in this case that insecure footwear, such as high heels, contributed to the accident.

BARREL ON TOES

THIS victim (?) of misfortune was carrying a 100-pound barrel of grease from a warehouse to a truck. He stepped on an oil spill and slipped. In trying to defy gravity and regain his balance, the grease barrel was left to its own devices. The dropped barrel landed on the workman's toes, bruising them. Once again the close interrelation of safety and good maintenance is proved. The oil spill should have been cleaned up. The man should have been wearing safety toe shoes, and he should have been using a hand truck to move the barrel instead of trying to carry it.

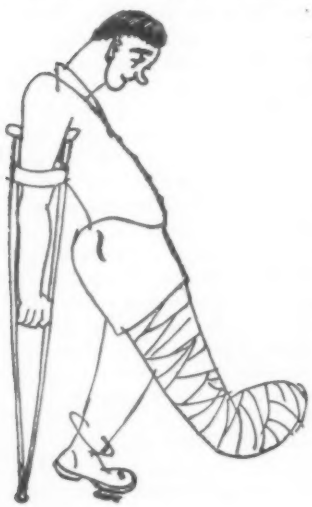
TOO FAST

"JUST like a shotgun," said a foundry worker in describing the noise made by an exploding grinding wheel. He was using the wheel to finish a casting when the accident occurred. Pieces of the wheel and the guard flew up to fifteen feet. The only injury was a minor bruise on the worker's arm because he and the other workers near him were wearing hard hats, goggles, gloves, and similar safety equipment properly. An investigation of the accident showed that the grinder motor was operating at 7,100 revolutions per minute, whereas the wheel was rated for only 4,500 revolutions per minute. As a result, all such air motors have been ordered to the tool room for periodic safety inspections.

HARD WAY

KEEP IT NEAT

POOR housekeeping, once again, was the cause of an injury. A welder left two pieces of sheet steel, one on top of the other on the concrete floor of a warehouse shop. A pick-up truck backed into the shop to remove a tool box, stopping with one of its rear wheels resting on the pieces of steel. When the unloading was finished, the driver released the clutch to start the engine and the truck rolled backward slightly. When the vehicle started, the wheel threw the top piece of steel backwards. It struck a wooden saw horse and then hurdled three or four feet farther, hitting a mechanic who was repairing a pump in the shop. The piece struck him about halfway between the ankle and knee and broke his fibula bone. In addition to the poor housekeeping practiced by the welder in leaving the pieces of steel, the truck driver was also at fault for not making a survey of the floor area before backing onto it. If he realized that he was on the sheets of steel, he should have made certain that no one was in the rear before starting up again.



LEARNING THE RIGHT WAY

WEARING his protective hat proved to be a wise move for Louis D'Amico, boilermaker at the Aliquippa Works of Jones & Laughlin Steel Corporation. A drift pin fell more than thirty feet from the top of a blast furnace bleeder and struck D'Amico's hat while he was fabricating floor plates for the furnace. The heavy pin drove into the laminated plastic hat, but was stopped short of his head. The inside cradle lining of the hat was properly adjusted to allow 1¼-inch clearance between the top of the hat and his head. Two other workmen at J&L's Aliquippa Works also recently escaped head injuries because of their protective hats.

Picture by courtesy of Mine Safety Appliances Co.

FIRE FROM HEAT

A FIRE in a printing and binding plant illustrates how heat may be transmitted through concrete and tile protection under a heating boiler and ignite a wood floor beneath. In this case, an oil-fired heating boiler located in the basement was mounted on a wood floor as follows: a three-inch layer of concrete was laid directly on the wood, and on top of this was one course of four-inch hollow tile, on which was superimposed another layer of one-inch of concrete, on which the boiler rested. The fire was discovered in the subbasement burning in the ceiling directly under the boiler, and fortunately was extinguished in its early stages by the fire department. In mounting appliances on combustible floors provision should be made for adequate ventilation under the appliance in addition to the necessary insulation. Ventilation may be provided by legs or by using courses of hollow tile laid with ends open.

THE INDUSTRIAL Nurse

EDITOR

ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

Health of the Nation

A STATEMENT dealing with the health status of the British population has been prepared by a leading public health official. His major findings represent in many ways the situation in our own country and are reproduced for that reason. His comments include the following: (1) The total burden of ill-health and disability is enormous despite the fact that it is probably much less than it was in former years. (2) Probably few who are working in one or another branch of curative medicine realize the relative contribution of their particular work to the alleviation of the total volume of human sickness. (3) the diseases which figure most in the work of an acute general hospital and in causes of death are by no means in all cases those which are most important from the point of view of the national health. (4) In considering disease from the point of view of the national economy we must have regard to its total evidence; its average duration; the period of life at which its incidence is highest; and its preventability. (5) For each disease consideration must be given to its aetiology and the means of preventing it. (6) With regard to the individual patients, it is doubtful whether sufficient attention is paid by their physicians to inquiry into exactly why they fell ill at that particular time and to the giving of advice on how the patients can, in future, prevent a further breakdown in health. (7) The important diseases from the national point of view are: minor catarrhal and respiratory infections; nervous and mental diseases; rheumatic manifestations—acute and chronic; tuberculosis; and heart and digestive disorders. If consideration is given to diseases which cause loss of working years of life by prolonged illness or death, tuberculosis is much more important than cancer. Lives saved in early manhood are much more important than prolongation of life of the aged. (8) Accidents are a fruitful cause of impaired capacity and a charge upon the public treasury. (9) The lag between a discovery in preventive medicine and its application should be reduced. (10) Preventive medicine often involves the discovery of early failures to maintain good health.

Hypersensitivity

WITH the availability of penicillin and other antibiotics, a number of problems have developed in the area of therapy. Among these is the question of hypersensitivity of individuals to these newly developed products. Another relates to the possibility of the development of resistant strains of bacteria. A report covering sensitivity to streptomycin deals with 447 patients who were treated with it, and with the cases of four nurses who handled streptomycin and developed contact dermatitis. In one of the four the condition developed after six weeks of exposure, the others after three weeks or more of handling the antibiotic. It was found that hypersensitivity is relatively much commoner in those who handle the drug than in those who ingest it. Hypersensitivity may be manifested as drug fever, a maculopapular rash, urticaria, or exfoliative dermatitis. It usually appears only after prolonged and intimate contact. Before streptomycin therapy is started information on possible previous contact with the drug should be obtained. If necessary, patch tests or intradermal tests should be made. The administration of a full therapeutic dose to a person who has become sensitized—usually a nurse or a pharmaceutical chemist—may be disastrous or even fatal, according to recent medical writings. Patients who are hypersensitive to streptomycin must be desensitized, or they cannot be benefited by the drug. The same cautious approach needs to be followed in the case of other antibiotics. The other phase—namely, the development of resistant strains—is a matter to which leaders in antibiotic

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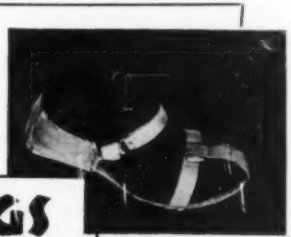
research and therapy have given much consideration. Remarkable results have been achieved in the treatment of the venereal diseases, pneumonia and a number of other diseases, through the use of antibiotics. If resistant strains of given bacteria were to develop, much will be lost insofar as the control of specific diseases is concerned. Thus far there is no definite evidence that this will be the case. In the meantime, all industrial nurses who may be required to administer antibiotic therapy should give heed to the element of hypersensitivity.

Health of the Industrial Worker

THE most reliable data relating to the influence and effectiveness of industrial medical services, industrial hygiene, and safety campaigns and services are to be found in the statistics of insurance companies and the U. S. Census on mortality. The insurance company which probably has had the most coverage of industrial workers reports that while the life expectancy of an industrial wage earner aged 20 was 36.9 years in 1911, this figure has now reached 48.4 years, an increase of 11½ years. Tremendous social and financial gains have likewise resulted. The increased life span of the industrial worker has reduced the number of widows and orphans, has lowered community responsibilities in many directions, and has added largely to the productivity and average wealth of this country. The encouraging aspect of the gain in life expectancy of insured industrial workers rests in the fact that the increased longevity has been continuous. But there are some aspects that still require attention. Despite the worker increase in life expectancy in recent decades the white industrial worker has a higher mortality and shorter life expectancy than other workers, although the difference is now far less than it was about 40 years ago. In 1948 agricultural workers and white collar workers at age 20 had a life expectation that was one year more than male industrial workers. Four decades earlier this differential was nearly 6 years, so it is evident that distinct gains have been achieved. On the whole, the industrial worker is much better off to-day than he was a generation ago. A marked reduction in working hours, considerable increase in purchasing value of wages received, health and safety measures installed in industry, laws regulating working conditions and providing for effective medical and surgical care for industrially acquired illnesses and injuries—all these plus other factors have helped. The advances in medical science in all its branches have likewise been of considerable assistance. The picture is comparatively good; much more progress can still be made.

PREVENT *Slips on wet smooth* With *surfaces*



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NON-SKID CANVAS SANDALS

SLOGS are designed to be worn over boots or shoes to afford extra protection on slippery surfaces. Three layers of cotton duck, woven in our own mill, give exceptionally high tensile strength and extra long wear. **SLOGS** are specially designed and *plant tested.*

NON-ABRASIVE—**SLOGS** can be worn on any wet, smooth surface without damage . . . inside storage tanks, vats, etc.

ADJUSTABLE—you need to stock only one size. **SLOGS** are easily and comfortably adjusted to any size footgear.

LESS-FATIGUING—**SLOGS** promote efficiency by reducing strain and the fear of falling . . . workers *want* to use them.

REVERSIBLE—you get double wear—double value by simply turning them inside out.

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$4.55 per pair in less than 1 dozen lots
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SIMPLIFY ANY LIFTING JOB

Easier to use—Cross-woven wire construction eliminates kinking and tangling, provides tight grip even around small radius bends. Wide, flat surface gives more stable load balance, minimizes crushing effect on tubing or similar parts.

Safer to use—Every sling pretested to twice rated capacity before shipment. Cross-woven construction reduces flexure of individual wires, thus lessens metal fatigue and provides longer life. Specially tempered steel handles adjustable for both choke and basket hitch.

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Retirement--When?

PRELIMINARY figures for 1950 released by the U. S. Bureau of the Census indicate that there are 12,322,000 men and women in the United States who are 65 years of age and over. The number of those in this age group quadrupled from 1900 to 1950, while the total population only doubled. The generally accepted basis of retirement, whether for employees of governmental agencies or in private industry, is age 65. Many are asking the question whether this is a proper age of retirement, in view of the additional life expectancy and years of potential usefulness still ahead. Any simple plan, such as fixing a given age, is apt to have a number of flaws. Some are really old at 60 or 65; others are in good health, vigorous and anxious to continue at their trades or occupations at 70 and beyond. Insofar as industry is concerned, especially when a skilled labor supply is not fully available, the question is posed as to whether or not some other basis of compulsory retirement should be set up. No one plan can fully meet all situations. Inevitably, compulsory retirement at 65 must hurt the national economy. Insurance plans, annuity arrangements, and social security requirements may have to be revised before long. In a recent conference, the officer of a large steel company read off the ages at which workers in his company were being retired in this heavy industry. A number of them were 75 years of age and older; a larger number were between 70 and 75; and, as might be expected, many more were 65 and over. The question was raised whether it would not be a better plan to change the 65 year limit, and to depend on amply documented medical department and production records of a worker in deciding when he should be retired. This general discussion is likely to assume wide implications in the years immediately ahead. If the suggested plan calling upon the medical department is tried out or adopted, an additional task of much importance will be placed where it may belong. Many medical departments are already participating. Others may be called on before long.

Workmen's Compensation Legislation

IN 1950, only 19 State legislatures held sessions in which workmen's compensation amendments could have been introduced. In five of these states major changes were adopted. These states include Kentucky, Massachusetts, Mississippi, New Jersey and Rhode Island. The Kentucky amendments included increased death, disability and medical benefits and improvements in certain administrative provisions. Maximum weekly death benefits were increased from $20 to $23. Maximum weekly benefits for temporary and permanent total disability were also increased. The former maximum limit of $800 for medical benefits was increased to $2500. Other benefits were also increased. In Massachusetts the law was changed by eliminating the restrictions relating to cases involving silicosis and other occupational pulmonary dust diseases. Under the amendment, such cases are now subject to the same provisions as other injuries, with the exception of a $5,000 total maximum limit for silicosis in cases in the granite industry. Other financial benefits were also increased. A rehabilitation commission was set up to study the problems faced by injured industrial workers. The Mississippi Workmen's Compensation law first went into effect in January 1949. Several amendments were enacted, including increase in the minimum weekly benefit for death or disability from $7 to $10. New Jersey increased maximum weekly benefits from $25 to $30. Previous restrictions relating to payments of benefits for hernia cases were removed. Coverage in Rhode Island was extended by removing the exemption for employees who earn more than $3,000 per year. Some benefits were increased. The time limit for suits in occupational disease cases was extended to 24 weeks from the date of disablement. Coverage was extended in Georgia, Idaho, Louisiana and New York. In seven states legislative committees were set up to study workmen's compensation laws. It is presumably quite evident that all industrial nurses should be familiar with the provisions and limitations of the workmen's compensation laws in the states in which they are employed.

Concern About Manpower Supply

THE country annually loses the services of many thousands of workers through accidental injuries whether of occupational or other origin. In addition to the personal losses incurred by the injured worker, there are the additional losses to the employer, to insurance carriers, to public and other agencies concerned with the care and treatment of the sick and their dependents. In many cases, the problem is one of adequate rehabilitation facilities, about which there has been much discussion, although the developments have been slow in evolving. A realization of this problem was high-lighted at the 17th National Conference on Labor Legislation held in Washington last November. One of the resolutions adopted reads as follows: "Whereas there are many agencies within States' governments which presume to deal with the many and varied requirements of physically and mentally handicapped citizens, but, for the greater part, their work lacks effectiveness because of lack of a central agency or committee to coordinate these activities; and Whereas this Conference, mindful of the grave, present national emergency, and particularly, our rapidly diminishing manpower supply, is conscious of the need of focusing public attention upon the problems of the handicapped, because if many who are otherwise qualified but possess some physical disability can be employed where their particular handicap is not a factor, then this will provide further reservoirs of manpower; and Whereas it is estimated that there are from 5,000,000 to 7,000,000 in the category of the severely handicapped, many of whom, if given proper medical, surgical, or therapeutic attention, education and training, or retraining vocational guidance and are then placed in suitable employment, it is manifest that all agencies having a part of the handicapped program belong under one general jurisdiction; Therefore be it resolved that the Conference endorses the proposal to establish, in each State an Advisory Council on Affairs of the Handicapped." When this comes about, a large pool of workers should result, and help to injured workers speeded.

Noise

HEARING impairment is a common defect. Its causes may lie in diseases of the brain and its membranes, general and infectious disease, effect of certain drugs, local causes, occupational and traumatic deafness, and various isolated conditions. Under certain conditions the normal ear can be damaged by sound or noise. These conditions include intensity of noise, frequency, range, continuity and individual susceptibility. During World War II a hundred young healthy individuals with no ear, nose or throat disease and with normal hearing, were subjected to continuous work in a chipping school in a shipyard. After working for 7 hours continuously in this environment, a representative group of these men had a definite hearing loss associated with tinnitus and a feeling of discomfort. By the following day the men did not experience any hearing loss. The initial loss was apparently a fatigue phenomenon of the nerve of hearing associated with a spasticity of the intratympanic muscles. However, after a month's exposure to this noise, there was a definite and permanent deficiency in hearing. The ideal solution of the problem of noise in industry and its effects upon the health of the worker is the same as the problem of noise anywhere—abatement and reduction of the noise, at its source. This may involve various engineering problems, as well as the reconditioning of walls, ceilings and floors to prevent or inhibit the transmission of noise by reflection and to reduce to an attainable minimum the amount of noise-reflecting surfaces. In many plants certain simple and inexpensive steps are all that are required to reduce some of the noise. The industrial nurse who is aware that noises can and do affect health and production will report plant conditions that can be corrected to her immediate supervisors. Those interested in reading more details about this problem are referred to Bulletin 142, U. S. Department of Labor, available from Government Printing Office, Washington, D. C. Price 50¢.

Here's an AMAZING BRAND NEW SAFETY SIGN that will be welcomed by Safety Men! Brady Safety Signs stick to wood, glass, metal, concrete, etc. without moistening. May be applied to any clean surface in a jiffy. No screws, nails, bolts or skilled help necessary. All you do is peel from card, apply where wanted and the sign is up to stay.

Brady Safety Signs are made of durable cotton cloth, Silicone Coated to resist dirt, grime and moisture. CONFORM TO ASA Standard Z35.1-41. Select your requirements from a complete catalog of standard safety messages. Cost only a few cents per sign. Immediate delivery. Specials made to order.

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PIPE MARKERS
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What's New...

A coupon is provided at the end of this section for your convenience in obtaining illustrated descriptive literature of products listed here. *Send the coupon or written request to:* Service Dept., SAFETY MAINTENANCE & PRODUCTION

SAFETY SHOES STITCHED WITH NEW THREAD

A REVOLUTIONARY advance in safety shoes is marked by the stitching of RICO shoes with thread of "DACRON,"* Polyester Fiber. This newest synthetic thread has proven over ten times stronger than regular cotton stitching on numerous abrasion and wear tests and has several times the tensile strength. In addition, it is resistant to chemicals, caustics, alkalis, bleaches, and common solvents. Plus the above features, this new thread is impervious to foot acids and perspiration which break down shoe seams under any conditions. Illustrated style with oil resistant corded sole is available in widths "C," "D," "E," and "EE." Numerous other styles are also available stitched with thread of "DACRON." For further information mark the coupon on page 74.

* duPont Trade-Mark.

NON-CAUSTIC DETERGENT

PLANISOL, a new type synthetic detergent for industrial uses, is non-caustic, non-flammable and non-toxic. Made by Chemical Detergents Co., Inc., of New York, it can be used in suitable concentrations for varied maintenance jobs. Planisol will strip paint from all surfaces: wood, steel, cement, etc. No neutralizer is necessary. Just wash with hose. A splash in the face or in the eye will do no harm.

For food processing plants, beverage industries, meat packers, etc., Planisol can be used in a ratio of one ounce to a gallon of water to destroy bacteria life. Slightly higher concentrations will remove grease and sediment from pipe lines, processing machinery, floors, ovens, etc.

The product has been successfully used in the paint and varnish industry for cleaning vats and stills quickly and economically. In heavy industry, it is used for degreasing and for pre-paint cleaning of railway cars of all types. For all its versatility, Planisol is also outstanding in its safety features. For details, use the coupon.

GOGGLE PLIERS

TWO new safety goggle pliers which simplify and speed up the replacing of side-shields on spectacle type safety goggles are announced by American Optical Company. The pliers, called the 169 Rivet Knockout Plier and the 170 Riveting Plier, are so designed that inserting or removing goggle rivets can be accomplished without removing lenses, and in just a few seconds.

On the Knockout Plier, one jaw is pointed to push out the rivet while the other jaw "squeezes" the rivet on all sides, holding it rigid. The rivet is pulled straight out so that it cannot bend, enlarge the rivet hole or damage the goggle frame.

The Riveting Plier is equally rapid and easy to use. One jaw guides the rivet while the other blunt end flattens it securely to the goggle frame.

Both pliers weigh less than six ounces each. They are built of plated steel to withstand hard use, and both have a scientifically placed fulcrum that assures maximum leverage with very little hand pressure. For details, send in the coupon.

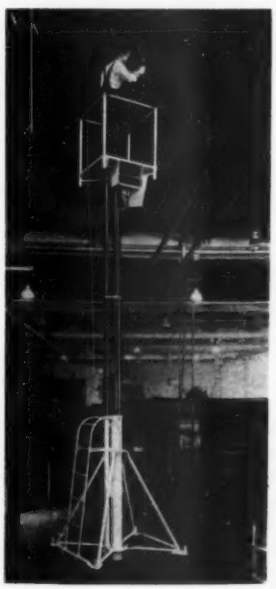
MOTOR-LIFT WORK TOWER

CONTROLLED by a foot-operated lever on the platform, this new electro-hydraulic work tower is quickly raised to permit reaching equipment or ceilings as high as 22-23 ft. No connection to an electric outlet is required. The telescoping tower is easily rolled anywhere and locked in the working position. Designed for one-man operation, the self-contained, all-steel "Moto-Lift" is the latest development of Safway Steel Products, Inc., of Wisconsin. It has a capacity of 400 lbs. and weighs approximately 600 lbs.

The work platform is elevated through extension of a hydraulic ram, with the hydraulic pump operated by a battery-powered electric motor.

Lowering of the platform is at a controlled speed which protects the worker. The platform can never drop suddenly, even in the event of complete hydraulic failure. If the full pressure were to be released instantaneously, the telescoping safety tube (seen next to the elevating column) would still insure a safe, gradual descent of the work platform.

The Safway "Moto-Lift" stands on a broad, stable base measuring 51 in. square. By telescoping two opposite side members, the base folds to 30 in. x 65 in., thus permitting passage through narrow doors. In addition, the tower will clear doors only 7 ft. high when the platform is in its full retracted position and the guard rail has been dropped. A positive safety brake on each caster locks both the wheel and the swivel in any working position. For details, send in the coupon.



REFLECTING WELDING LENS

A SPECIAL type of reflecting lens for use in conjunction with present filter lenses and cover lenses of welding helmets and goggles has been developed by Steinwach's Safety Supply of N. Y. The Silver-Glo Lens is designed to sharpen the outline of the object being welded, and to reduce eye strain by reflecting the rays and the heat given off by the work.

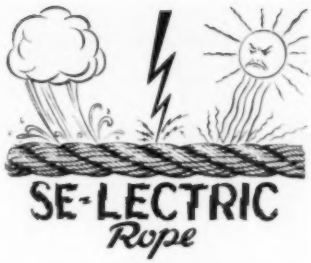
This very thin lens provides greater comfort for welders. It should be placed in back of the clear cover lens and in front of the dark filtering lens. The lens is made from cellulose acetate, coated with silver, and is slow burning. For details, send in the coupon.

EXPLOSION-PROOF FLOOR MACHINE

A NEW explosion-proof all-purpose floor machine has been announced by Holt Manufacturing Company of California. Called the Commander, it's designed to maintain floors safely in powder factories, atomic research plants, oil refineries—wherever positive safety steps are required. The Commander does a fast, economical job of sanding, waxing, polishing, scrubbing, wire-brushing, steel-wooling, and grinding floors.

This rugged new machine is vapor-proof, spark-proof, and shock-proof. It is custom-built under safety regulations. All wiring, all electrical apparatus is safety-tested and sealed. All electrical fittings and connections bear the Underwriters Approved Seal of Safety. Flames or sparks can't escape to set fire to gas, dust, fumes, or vapors. All moving outside parts are built to eliminate external sparks from static. Thick, safety-tested metal enclosures prevent all possibility of explosion.

With the Explosion-Proof Commander, users gain protection for valuable buildings and equipment; may qualify for lower insurance rates; and increase worker-safety with better-maintained floors. For details, use the coupon.



NON-CONDUCTIVE ROPE

NOW the rope making industry announces an important development in rope safety, thanks to a combination of new techniques and miracle chemicals used in the manufacture and processing of the new rope, known as SE-LECTRIC Manila Rope. Made by South Eastern Cordage, of Ohio, this new safety rope "fights off water" and possesses remarkable non-conductivity features.

The new SE-LECTRIC Rope was specifically planned for the protection of Linemen, Maintenance and other workers who face electrical hazards. Its added safety factors make it ideal for many other uses in home, farm, factory, marine and in construction, both indoors and out.

An Interesting Research and Test Booklet gives detailed facts and figures on the results of "actual use" tests in comparison with other treated and untreated manila ropes. In one test example, it shows where it requires only 5.00 KV of voltage impressed on a 5-ft. piece of untreated ½" rope to produce 10 milliamperes of current, while SE-LECTRIC Rope non-conductivity requires 73.00 KV of voltage or about 15 times more to force the same current through. Both ropes were showered with water for two hours before the tests. Other tests show similar startling results of SE-LECTRIC superiority. Test Booklets and sample of SE-LECTRIC Rope can be obtained by sending in the coupon.

NEW TYPE FIRE DETECTOR

EMPLOYING a new principle of fire detection described as "Rate Compensation," Fenwal, Inc., of Massachusetts, has just marketed a new model functional design fire detector. The unit is intended to give improved protection to human life and critical equipment in such structures as schools, hotels, hospitals, office, public and mercantile buildings, warehouses, and ships. The fixture fits snugly and unobtrusively against the ceiling and is mounted in a curved steel case. It can be installed within new or existing alarm systems, or can be made to actuate an extinguishing system directly.

Called the Fenwal DETECT-A-FIRE, the unit has the unique property of giving an alarm precisely at the moment the surrounding air reaches the temperature for which the device is set. For example, if fire warning is desired at 140° F, the DETECT-A-FIRE is pre-set at the factory for this point. The unit will then operate promptly and without time lag.

Construction of the DETECT-A-FIRE is unique. It employs a stainless steel "sensing" tube which is always in direct contact with the air. Hermetically sealed within the tube are silver electrical contacts. Expansion of the tube with heating of the surrounding air brings the contacts directly together to sound an alarm or to operate extinguishing equipment. Units are available for either normally open or closed circuits.

Temperature settings up to 325° F may be had. An area as large as 625 square feet can be protected by a single unit. The DETECT-A-FIRE is virtually indestructible. It is repeatable, resetting itself accurately after each alarm. The device carries the approval of the U. S. Coast Guard, and Factory Mutuals Laboratories, and is listed by Underwriters' Laboratories, Inc. For details, send in the coupon.

SHATTER-PROOF SAFETY PLIERS

THE Osborn Manufacturing Company, of Indiana, announces that it will exhibit its newest line of safety pliers for punch press operation at the October National Safety Show in Chicago. They will be on display in the Punch Press Section at the Congress Hotel. In addition to its safety pliers, the firm will also unveil its new lightweight forging tongs and cable saddles for use in supporting cable and water cooling hose for conveyor line spot welding.

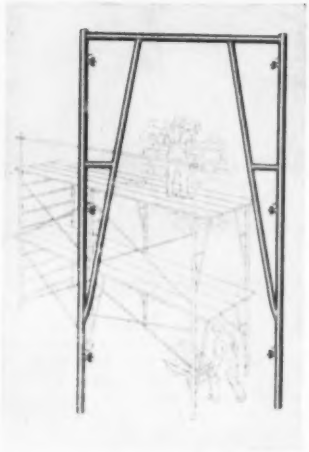
The chief advantage of these newly developed Osborn Safety Pliers is their ability to flatten instead of shattering if accidentally caught between closing press dies—a feature that not only protects the operator's eyes and hands from broken fragments but protects the press dies as well. This new protection is achieved through the use of Osmolloy—an aluminum alloy that is very light yet has ample tensile strength to support work being fed to the press. The firm is equipped to furnish special designs for virtually every type of press feeding application. For details, send in the coupon.

SAFETY SIGNS

A NEW line of eye-catching safety signs designed to make workers stop, look and heed, has just been announced by Eastern Metal of Elmira. The Safety Sign Division has been expanded, according to Burleigh Names, President, to produce signs designed to help prevent accidents which occur in public utilities and general industrial concerns. In addition to the danger and caution signs, there are safety first signs with special warning messages, and directional signs to eliminate confusion. Particular attention has been given to the design and placement of the lettering so the signs can be read quickly and the message will be unmistakable. The colors are bright and striking, and the message "stands out." All Eastern Metal signs are lettered strictly in accord with recommendations of the U. S. Department of Commerce and are made in compliance with official American Standards Association Specifications.

The signs are built for rugged service of heavy-gauge steel, with a flexible baked enamel finish to resist weather, vandalism, stone bruises and other destructive elements.

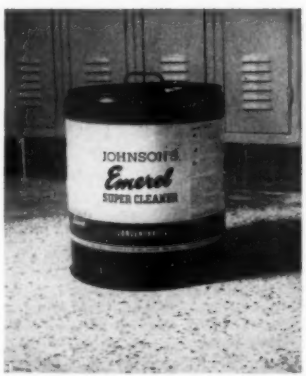
The new line of safety signs has been produced in response to requests for modern signs and a convenient eastern source of supply. Eastern Metal also manufactures Traffic Signs and has recently introduced a special "A" Standard which has earned the praise of safety engineers because the frame opens into a wide base and won't blow over in strong winds or from the backwash of passing trucks. For details, use the coupon.



SCAFFOLDING END FRAMES

TWO new types of end frames, designed for light commercial builders and mason contractors, have just been added to the line of tubular steel scaffolding by Bil-Jax, Inc., of Ohio. The frames are each 36 inches wide by 6 feet high, and are interchangeable. Low-price, coupled with safety and versatility, also make this equipment suitable on many remodeling and maintenance applications.

One frame is ladder-type, for use at the ends of the scaffolding installation in eliminating need for other ladders. The other is open-type to permit passage underneath of workmen wheeling materials. All joints are electrically welded. The frames are combined into towers by attaching diagonal braces in the usual Bil-Jax way. There is no need to remove wing nuts in attaching or removing braces due to the patented brace lock which is an exclusive Bil-Jax feature.

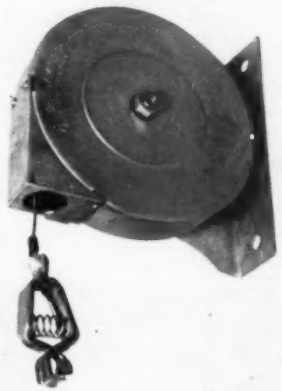


FLOOR CLEANER—DEODORIZER

A NEW fast acting floor cleaner and deodorizer, called "Emerel," is the latest maintenance product to come out of the world-famous Research Tower of Johnson's Wax, in Wisconsin. Emerel is safe for all types of floors, and can be used to clean washable walls and woodwork. It loosens dirt, grime and floor stains without scrubbing. Yet, in spite of its fast, effective action and ease of use, it contains no harsh chemicals, no abrasives, no free alkali or harmful acids.

Formulated as a concentrate, Emerel is mixed in a ratio of 1 to 20 and may be used with either hot or cold water. Spread on the floor and gently agitated, it loosens floor films and stains, including oil, grease, ink and rubber marks. In less than a minute all dirt is floated free of the floor surface and is ready for removal. Emerel also deodorizes as it cleans.

This new Johnson product was especially formulated to eliminate the scrubbing formerly needed to properly clean terrazzo, marble, ceramic tile, and vitreous tile found in corridors and lobbies. It may also be used for rubber and asphalt tile, linoleum and wood, new types of plastic flooring as well as other washable surfaces. It is available in 1-gallon and 5-gallon cans and 55-gallon drums. For details, mark the coupon.



FUELING GROUNDING CABLE

FOR protection against the generation of static charges on fuel servicing equipment during the transfer of combustible fuels, Benjamin Reel Products, Inc. of Ohio has developed a grounding cable and clamp in convenient reel form. This Grounding Reel serves as an added precaution in eliminating fires and explosions caused by the discharge of sparks in the vicinity of flammable fuels or vapors. The reel keeps the cable off the ground where there is always the possibility of damaging or entangling it and making it useless.

The reel is equipped with 40 feet of 3/32" diameter cable. All parts of the reel are cadmium plated or are of rust-resisting material. There is uniform tension throughout the entire length of the cable when it is paid out. Where constant tension is not desired, the Grounding Reel can be provided with a ratchet arrangement to latch the cable at intervals. For details, use the coupon.

September, 1951

To Safety Maintenance & Production

75 Fulton St., New York 38, N. Y.

For prices and complete details of items mentioned in this month's "What's New in Safety Products," check items that interest you and mail coupon.

- ☐ Safety Shoes Stitched With New Thread
- ☐ Non-Caustic Detergent
- ☐ Goggle Pliers
- ☐ Motor-Lift Work Tower
- ☐ Reflecting Welding Lens
- ☐ Explosion-Proof Floor Machine
- ☐ Non-Conductive Rope
- ☐ New Type Fire Detector
- ☐ Shatter-Proof Safety Pliers
- ☐ Safety Signs
- ☐ Scaffolding End Frames
- ☐ Floor Cleaner-Deodorizer
- ☐ Fueling Grounding Cable

Firm Name .....

Attention of .....

Position .....

Firm Address .....

City .....

bulletins and catalogs · free bulletins and catalogs

As a convenience to executives, the new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE & PRODUCTION. The catalogs, data sheets and technical bulletins reviewed here present the latest information on protective and maintenance products and equipment. Use the Reader's Inquiry Coupon.

Eye Safety Program 1
Bausch & Lomb Optical Co. This unusually useful folder offers the industrial safety director the necessary supplies for a 5-way program for eye safety. Included in these educational aid materials are: safety posters, scripts for public address systems, stories and pictures for house organs, pamphlets for inserting in pay envelopes, and a valuable quick selector guide for choosing the correct type of eye protective devices for various jobs and hazards.

Asbestos Hand Protection 2
A. Pendleton Co. This 8-page catalog describes and illustrates this company's full line of asbestos protective clothing including specifications and prices: Gloves and mittens with various types of cuffs, leather-palm gloves, reinforced mittens, thumb and index finger mittens, sleeves, aprons, and finger cots. Each type is described in detail.

Work Shoes 3
Cedar-Crest Shoe Company. The complete line of work shoes for industrial workers and farmers, grouped by specialized features, are shown in an attractive 38-page catalog. Fully illustrated, the booklet shows high and low styles of work shoes, all-weather leather boots, safety-toe shoes in work and dress styles, VulCork solad shoes, Engineer's boots, Logger's boots, Army service shoes and women's service-type oxfords.

Gloves and Mittens for Every Purpose 4
Midwest Glove Co., Inc. An unusual feature of this 4-page illustrated catalog of leather work gloves is a section entitled "How to Select Work Gloves." This section includes drawings of the Gunn and Clute patterns which will aid purchasing agents in selecting the type of glove most suitable for the job. The catalog shows all types of leather gloves and mittens available with various cuff styles.

Porfil Floor Sealer 5
Masury-Young Co. A fast-drying sealer for concrete floors to prevent dusting is described in a 1-page bulletin. It describes how to apply the product to wood and concrete floors, makes recommendations for the daily maintenance of such floors, and points out the resistance of the product to water, acid, and alkalis.

Cement Floor Finish 6
General Floor Co. A special long wearing cement floor finish of low-water ratio, adaptable to a broad range of commercial and industrial floor applications, is fully described in a 4-page bulletin. The product, "Monarock" included a mixture of a tough aggregate to strengthen the concrete surface. The bulletin is fully illustrated.

Facts About Floor Safety 7
S. C. Johnson & Son, Inc. How to make floors as safe as possible is the subject of a new 20-page booklet which lists three factors: proper initial finishing, correct methods of routine maintenance, and careful selection and use of products. It recommends correct procedures for asphalt and rubber tile, linoleum, wood, concrete, and terrazzo. A special section lists the danger points, important from a safety angle, in the maintaining of various types of floors.

Plastic Rock Flooring 8
United Laboratories, Inc. An instructive 8-page brochure on Plastic Rock Flooring tells the reader how and where to apply this type of product and gives him technical data about the product itself. Many typical flooring applications are illustrated and its use for the re-surfacing of traffic areas is featured.

Magnetic Separators 9
Eriez Manufacturing Co. Complete source material on the subject of non-electric permanent magnetic separators for tramp iron removal is available in a new 16-page catalog. It includes complete descriptions of separators, pertinent engineering data with pictures and tabular specifications, information on the selection of a correct type, etc.

What Dew Does 10
Minnesota Mining & Manufacturing Co. The answer to the question "What Dew Does to Nighttime Visibility of Safety Signs" can be found in a 4-page bulletin which summarizes the results of research on the visibility of six types of highway safety signs. It was found that some types of reflective signs lose much of their visibility when moisture condenses on the surface. Others showed little loss and a rapid recovery to normal conditions.

Permalite Aggregates for Roofing 11
Great Lakes Carbon Corp. A new 8-page brochure with illustrations describes the use of Permalite aggregate in concrete, as a lightweight insulating roof fill. It features the product's excellent insulating properties, fire resisting qualities, lightweight, strength and economy. Included are various mix designs and other technical data.

Mobile First-Aid Unit 12
William Radoff Co. A 4-page folder, illustrated with drawings, gives full information on the Dural Mobile First-Aid Unit—100 which is designed as a civil defense item for industries or buildings having personnel not exceeding 100 persons. The folder shows how the compact, portable unit can be mounted on the floor or hall and lists the medical supplies which the unit contains. Mention is also made of a larger unit for locations involving up to 500 people.

Fight Athlete's Foot 13
Waverly Petroleum Products Co. A well illustrated folder describes the use of Sani-Mist and a special spray dispenser for use in shower rooms to help prevent athlete's foot. The folder points out that this equipment is easy to use, and that it is so designed that the solution retains its full strength.

Industrial Protective Cream 14
Hygiene Research Inc. An informative folder gives full information on a multi-purpose barrier-type protective cream, Verex. The folder recommends the product for protection against coolants and solvents used in the mechanical, painting, chemical, and other industries. It also gives special uses for the cream and points out the advantage of having it packaged in tubes.

Electric Hand Dryers 15
Chicago Hardware Foundry Co. A new brochure is available on the faster drying Sani-Dri Hand and Face Dryer, featuring ease of mounting, ease of use, improved heating element, simple maintenance. The brochure is well illustrated and lists typical industrial, educational, public building, and amusement applications.

Suspended Under-Side Light 16
Pyle-National Co. A new illustrated bulletin describes the Anchorlite, a suspended underside and inside illuminator to replace extension cord lights. The bulletin explains its uses in freight car and truck-trailer loading, auto repair and servicing, and storeroom bin lighting. Installation details and required fittings are included.

Electrical Fittings 17
Buchanan Electrical Products Corp. A new 12-page catalog offers a complete line of solderless wire connectors, cable and conduit fittings and wiring devices. The fully illustrated catalog includes specifications, dimensional data, application instructions and ordering information.

How to Prepare Your Plant for Atomic Attack 18
Walter Kidde & Co. This 32-page booklet deals with industrial plant security in the atomic age. In simple language it gives information on the destructive potential and limitations of the atomic bomb, tells how to organize personnel to cope with possible disasters, and makes recommendations for strengthening plant construction and keeping up production in the face of bomb attack.

Civil Defense Communications 19
General Electric Co. A new 12-page brochure pictorially presents typical communication systems now in use which can be coordinated into a community emergency network. It also describes the company's technical advisory service for civil defense radio communications, listing 22 specialists throughout the country who are available without charge to analyze communication systems and make recommendations.

Automatic Lubrication 20
Trico Fuse Mfg. Co. A new 4-page bulletin has been designed to help lubrication and maintenance men in selecting the proper visible, automatic oiler for constant-level, gravity wick, underfed, multiple and large capacity gravity feed applications. It contains valuable suggestions on how to eliminate the waste and dangers of hand oiling and how to reduce maintenance costs. Photos show actual applications.

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September, 1951

Windowless Buildings

(From page 61) or manufacturing building with numerous occupants.

Large sales basements are usually windowless and often have crowds of people in them but good exit provisions and automatic sprinkler protection have been widely recognized as satisfactorily taking care of the hazard to occupants and to firemen in these basements.

Methods of Protection

In a similar way good exit provisions with proper enclosure of stairway, elevator and other floor openings, and automatic sprinkler protection may be expected to take care of the hazards in windowless buildings generally. This is the way the subject is handled in the National Building Code recommended by the National Board of Fire Underwriters. The code requires approved automatic sprinkler equipment to be installed and maintained in all buildings erected or altered to exceed 2 stories in height or 2,000 square feet in area on any floor above the first or ground floor, which are without suitable access to each story above the basement on at least one side of the building. Suitable access is defined as requiring a usable opening through the wall at each story at least 32 inches wide, 48 inches high and with the sill not more than 32 inches above the floor; the openings shall be so spaced that there will be one opening for each 50 feet of frontage.

Good exit provisions include not only an ample number and capacity of properly lighted exit ways but also proper separation of exit stairs and hallways from the rest of the building by fire resisting construction. This and also the enclosure of other stair and elevator and similar floor openings are covered in modern building codes.

The removal of smoke from a windowless building presents a problem of interest from several standpoints. In a building having a large number of occupants it may be desirable from the standpoint of safety to life to provide means for removing smoke during the early stages of the fire. From the standpoint of the firemen it would be desirable to have means for removing the smoke throughout the fire period. In any event the building management or others will be faced with the problem of removing the smoke after the fire. Standards of the National Board of Fire Underwriters (Pamphlet No. 90) recommend that in windowless buildings where the panic hazard is pronounced means be provided for mechanically removing smoke.

Windowless buildings usually require mechanical ventilating or air conditioning equipment. Such equipment together with any exhaust equipment available can usually be specially arranged to serve for removal of smoke. In sprinklered buildings it would be proper and in some cases desirable to have such equipment operate automatically on detection of fire or smoke. It is important that smoke removal systems be arranged to keep smoke away from exit ways.

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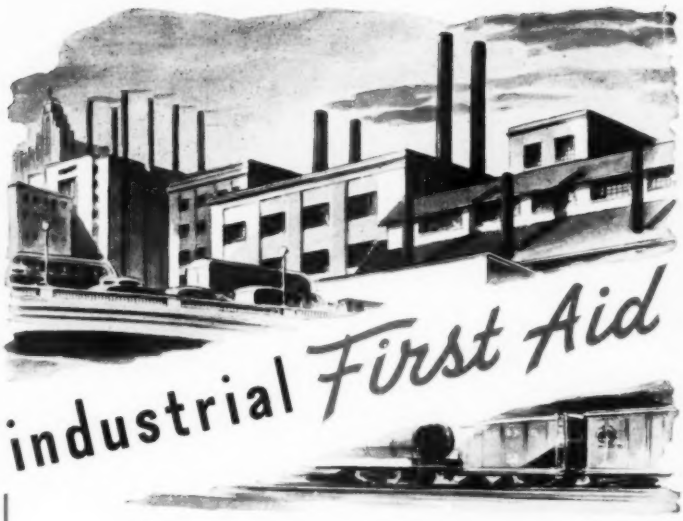

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